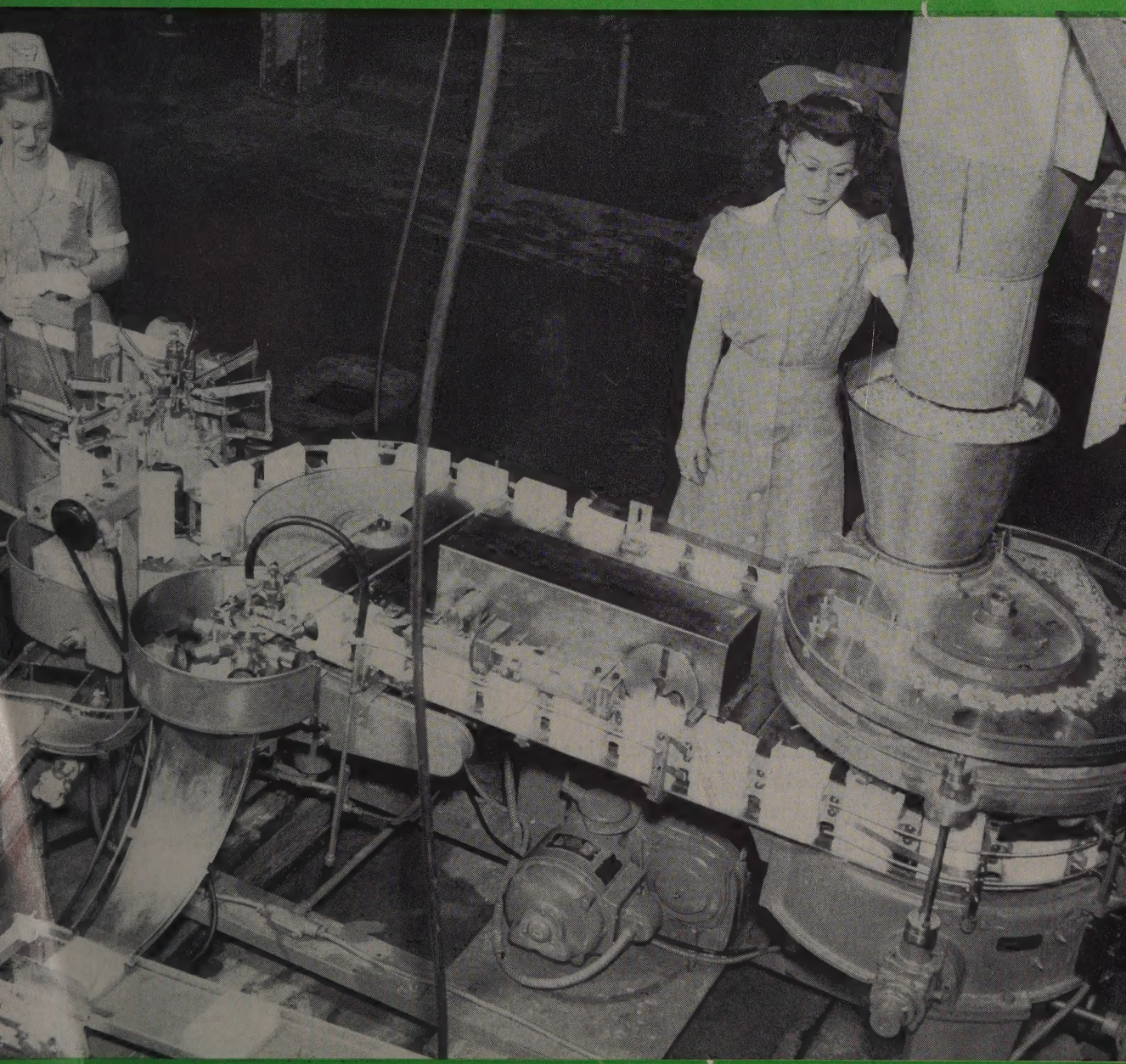
JANUARY 1951

Food Packer

THE NATIONAL MAGAZINE FOR PRODUCTION LINE MANAGEMENT

Packing frozen foods at 225 a minute at Seabrook Farms, Inc. See page 25.



Pasteurizing in a split-second SEE PAGE 20

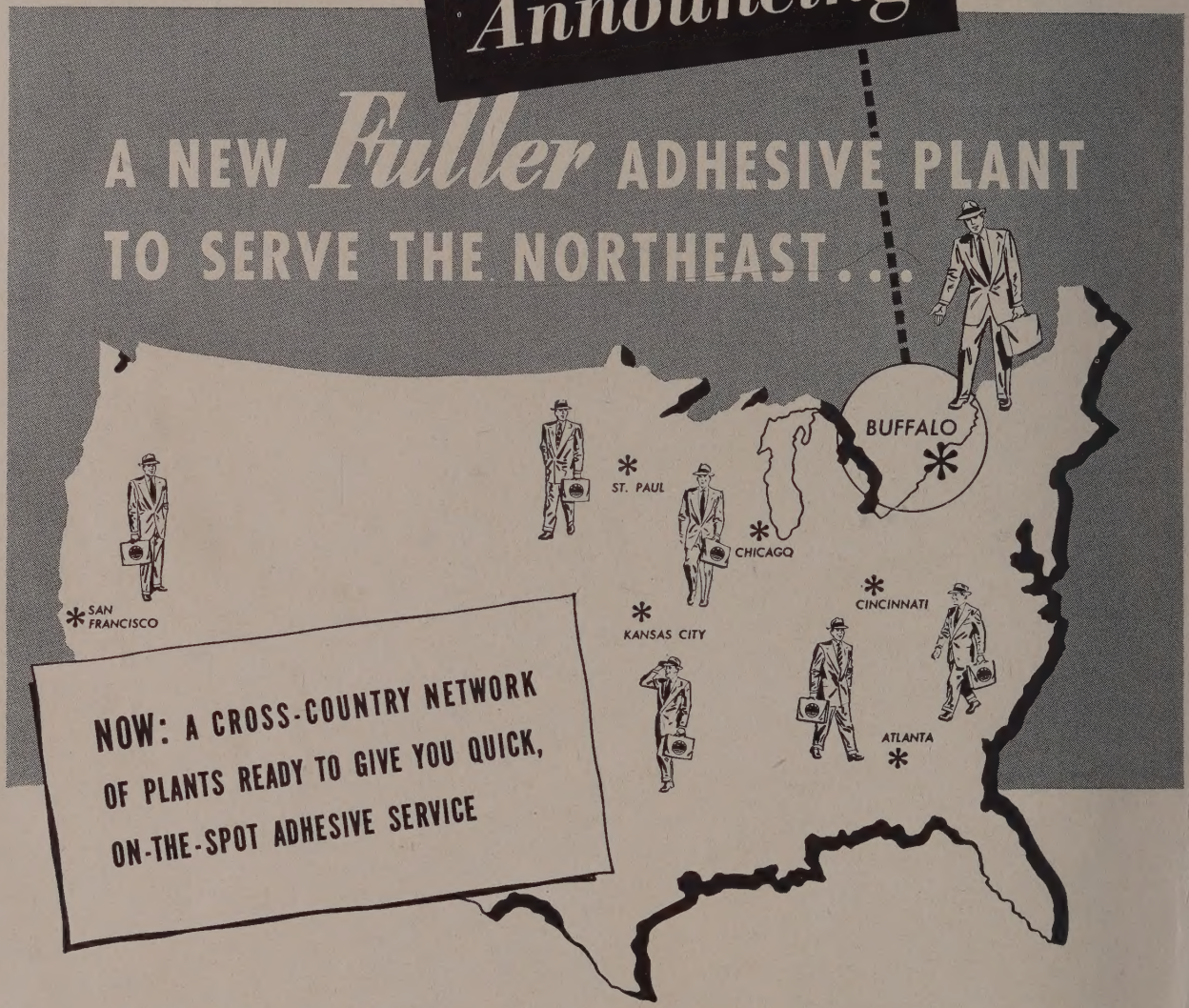
End-opening case cuts big-can pack cost SEE PAGE 19

New wrinkles in crop disease control SEE PAGE 31

A Vance PUBLICATION

Announcing

A NEW *Fuller* ADHESIVE PLANT TO SERVE THE NORTHEAST...



Another new Fuller Adhesive plant has just been established at Buffalo, New York. With complete manufacturing facilities, a competent staff of adhesive experts is ready to serve users of industrial adhesives in the northeast states.

The new plant joins the network of Fuller plants, warehouses, and offices situated strategically across the nation. There's a Fuller production or supply center *near* you . . . and Fuller Adhesive specialists are "on call", ready to help you solve your adhesive problems—in Fuller laboratories, in your plant, or in the field.

H. B. FULLER COMPANY
Manufacturers of Quality Adhesives Since 1887

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The next time you need adhesives, call on the Fuller plant nearest you!

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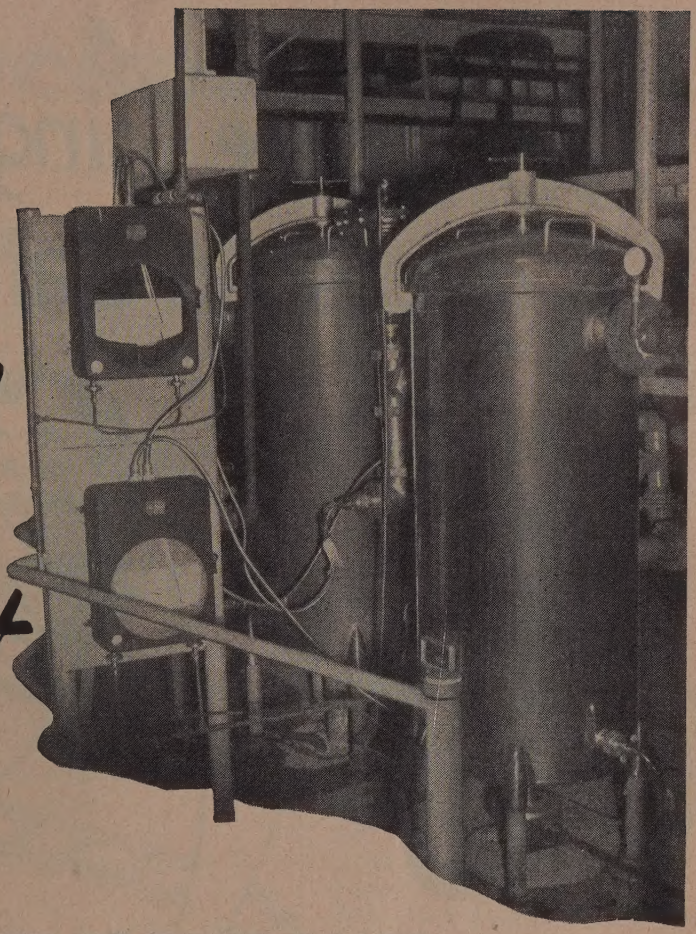
Atlanta • Cincinnati • Buffalo

Offices and Warehouses: Portland • Ogden • Denver • Dallas
Houston • Weslaco • Detroit • Cleveland • Indianapolis
Louisville • Tampa • Richmond

air in your product



CAN TAKE THE WIND OUT OF YOUR SALES

Yes, a little thing like excessive oxygen in your product can materially affect your sales. Dissolved air can destroy product appearance . . . adversely affect flavor, color, aroma and vitamin content.

Rex Micro-Film Deaerators can help you put some "push" behind your sales. They effectively remove excess oxygen . . . preserve food flavor, color, vitamins.

For example, in a tomato juice canning plant, Rex Deaerators are used to remove dissolved air prior to the application of heat; an important step in preservation of vitamin C. Rex Deaerators are also used extensively to remove the oxygen bubbles that cause "black neck" and the hard core in tomato catsup.

Why not investigate the possibilities of Rex Micro-Film Deaerators for your operation? Whether you process catsup, tomato juice, soups, fruit juices, baby foods, frozen concentrates, or almost any fluid or semi-fluid product, these efficient units can help you improve product appearance and flavor . . . help step up sales. For all the facts, mail the coupon.

Chain Belt Company 50202C
1647 West Bruce St., Milwaukee, Wis.

Gentlemen:
( ) Please send me a copy of Bulletin 47-1
( ) I would prefer to have a Rex Food Processing expert call on me.

Name.....

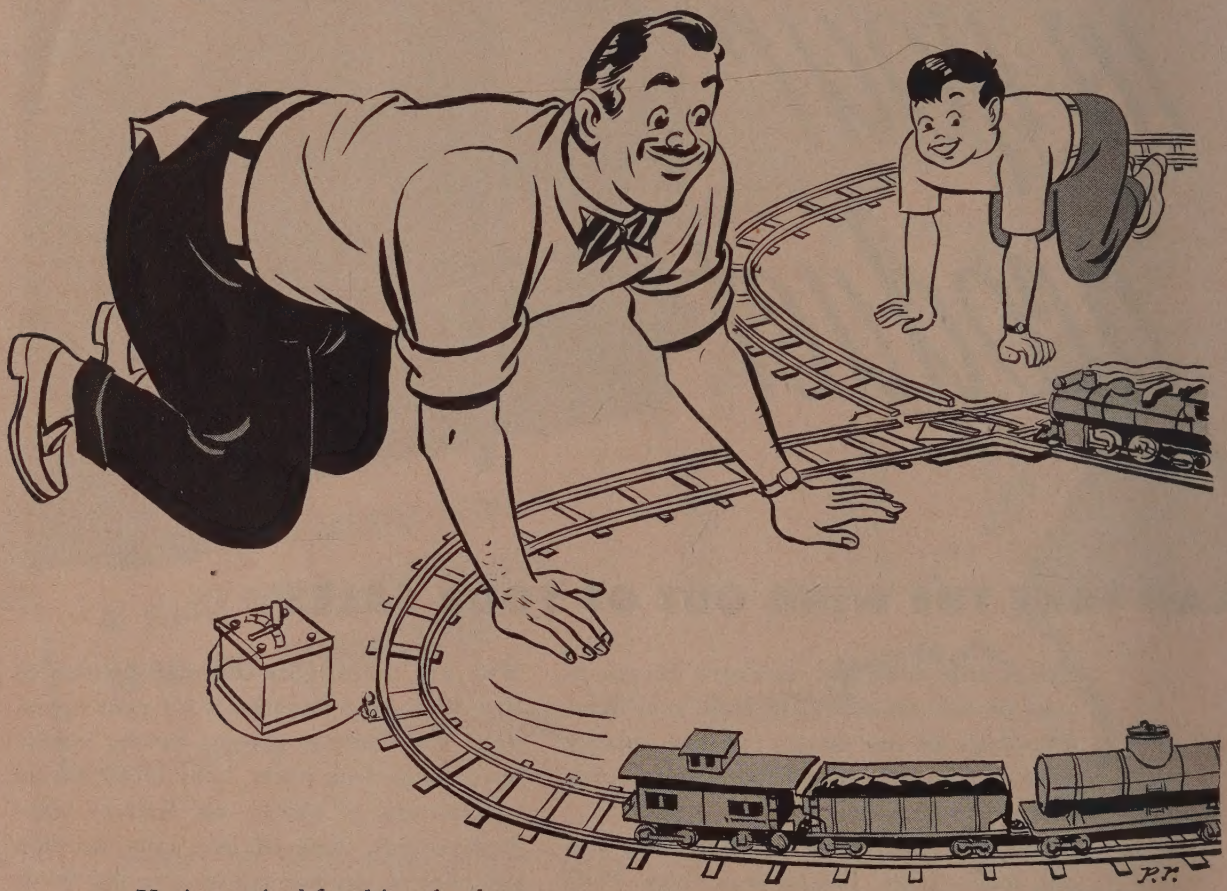
Company.....*Dept*.....

Address.....

City.....*State*.....

. . . CHAIN BELT REX COMPANY FOOD PROCESSING EQUIPMENT

Some things give solid satisfaction



You've waited for this—the day you and your son would reach across the years and share a boy's pleasures together! Something of the same satisfaction is yours when the success of your product justifies all the effort you've put into it.

Of course, you've used sugar. To quality manufacturing, sugar brings a uniformly high standard of purity. Sugar has 10 to 50% more sweetening power. Sugar alone brings out the best natural flavors of higher-priced ingredients.

Set your signals for a clear track —always use sugar. It pays off in solid satisfaction.

SUGAR
INFORMATION
INC.
NEW YORK 5 NEW YORK

Food Packer

January 1951

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WHY SOME SALT MAKES A GOOD MIXER!

Seriously, if *rapid* salt solubility is a particular problem in your manufacturing or processing, you might be interested in knowing why Diamond Crystal Alberger Process Salt is such a fine "mixer."

Unlike slow crystallization methods, the Alberger system makes use of high brine pressure which is developed to such an extent that supersaturation takes place in a special chamber. When this pressure is suddenly released, the salt is literally blasted out of solution into fine "flasher flakes"—all within a fraction of a second!

These microscopically small "flasher flakes" differ from the usual type of salt crystal because they possess a high specific surface which permits them to dissolve much faster than ordinary salt crystals.

If you require a quick-dissolving salt, you can count on Diamond Crystal Alberger Salt for *more rapid solubility*. Our Technical Director will gladly recommend the correct Diamond Crystal product for best results in your processing. Write: Diamond Crystal, Dept. J-26, St. Clair, Mich.

DIAMOND CRYSTAL Alberger PROCESS SALT

How things stand

The Industry in the past thirty days

Wind & weather

WASHINGTON—Below-freezing temperatures made a trial run in Florida, as you know, and then moved over into Texas where they did in most of the remaining green beans in the lower Rio Grande Valley. Probably some time this month there'll be supplies of string beans in the market; both from Texas and from Florida. At this writing the damage to the grapefruit crop in Texas hasn't been determined; but some growers fear, if not the worst, at least something they're not prepared to like. Tomatoes were coming into full harvest in the lower Rio area when they got punked out by frost. Florida tomatoes gave up the ghost earlier; so, for some time to come, the chief source of tomatoes will be imports from Cuba and Mexico.

About half the pepper crop, planted last fall, got knocked out; and eggplant and squash were seriously hurt. Texas cabbage was pinched pretty hard but will make a partial crop. Something like a fifth of the winter plantings of lettuce were badly frosted. And, to make it intersectional, torrential rains in California did heavy damage to the winter vegetables in that State. Sure enough, the general wreckage probably isn't as bad as this brief summary would indicate. Despite their lack of defenses against cold, flood and drought, vegetables are persistent. And there's been replanting.

Price and cost

Prices of canned foods, at this writing, are rising in an uneven way; but most experts in the industry are of the opinion that these prices must advance all along the line. The most cautious people say they don't see how prices can decline. Vegetable canning in the South, because of the hard freezes, may not pick up much real volume before spring. No one knows what purchases for the Armed Services will be; but most observers, noting the heavy increase in draft quotas, take it for granted that this volume must be stepped up rapidly.

Prices of cans, as estimated at this writing, will advance by 12 to 15 percent; and can makers were unable to get the plate needed to supply the orders rushed to their offices to beat the turn-of-the-year increase. The NPA has been asking the Can Makers Advisory Committee for suggestions about how best to restrict or even to cut back the industry's use of tin plate. The cut-back has now been officially set at 20%. One source says can manufactures will probably reduce tinplate usage across the board, to distribute the cutback fairly.

Rumors of possible and in fact probable further increases in wage rates and in the cost of vegetables and fruits are causing jiggles in market quotations. This is an unstable and erratic period; and it's unwise and definitely unfair to make anything like a firm prediction.

Imposed controls

It isn't smart to rely upon governmental staff difficulties to delay controls for long. Events are too dangerous; move too fast. If controls are needed, they'll be imposed; if, when and as. Better keep that in mind. Attorney General McGrath has said that, whatever price limits are fixed, they should be flexible and subject to adjustment on the basis of constant studies. The Attorney General thinks complete controls can't be made to operate except in a full-scale war. So if you know when f.-s. war is due, you know about controls.

The CCC is buying half a million gallons of concentrated orange juice for the school lunch program; which probably will advance the market price. Government buyers are hesitating over purchases of grapefruit juice; many pupils don't like it unsweetened, and sugar-added juice costs more. This is a blow to producers, who had counted on the school youngsters to drink up a lot of the anticipated surplus. The CCC will buy quite a lot of canned fruit for the lunch program, since the government cupboard has gotten low on this item. Agriculture has been buying apples and also smoked pork shoulders for the young scholars.

The National Canners Association has set up a War Mobilization Committee of fifteen canners, plus President Henry P. Taylor who will be chairman. This, says the NCA, points up once more the essentiality of canned food as an offensive and defensive weapon, under war and war-preparation conditions. A group from this committee has told government mobilization agencies that the canning industry, as always, is prepared to do its full part in this emergency or in any future crisis. This isn't news; since everybody knows the industry will do its stuff. But it may serve to remind some preoccupied people that Uncle Sam is facing an emergency.

Retail prices of cost-of-living foods in December were about six percent higher than a year ago; and two-thirds of that advance came during the first half of the year. But this isn't too revealing; since retail competition has slowed retail price advances, especially in the larger stores. Wholesale commodity prices are more than 14 percent higher than they were in the last month of '49; and wholesale food prices are more than 15 percent higher. Individual buying power in general is much larger now than a year ago; although you may know a couple of other fellows who are exceptions to the rule.

The wise men of the industry say food prices will continue to rise; although they attach a lot of conditions to their guesses. Growers will have the top cards in the game of negotiation of contracts with processors. Farmers and packers will have trouble getting labor, even at high wages. Heavy buying of food, at the consumer level, is probable for some months; possibly well into the spring, at least.

Well, that's one side of the story. The other is that when all the advances at the farm gate get translated into retail price tags, and when these figures get pushed up farther by Uncle's purchases for his boys in uniform, and when increased wages paid by processors get added on, it's an easy guess that Aunt Carrie and her housewife neighbors are going to assault Washington something terrible. They're going to want controlled prices; and Aunt Carrie is right handy with a coercive political rolling pin.

Feet dragging

So far, all the new and skeltonized control agencies are dragging their feet. They're marvelous at thinking up reasons why they can't do anything. Sure enough, they've screwed down mildly on credits, and they've taken some scarce metals away from civilian users. Well, what'll happen when Aunt Carrie cocks her irresistible rolling pin and lams into the immovable Washington agencies? Brother, if you know that one, you're qualified to answer the classic question of childhood: "How far can a cat spit?"

This page makes the conventional guess that out of the big collision there'll issue some interesting by-products. The American Institute of Food Distribution has put out the wisest possible advice: "... get your affairs in shape for anything."

—ROBERT Y. KERR

★

Small packers

Super Market Institute looks for a boom for national brands over private brands. "National brands, which showed powerful growth during the periods of shortages in World War II, are expected to become even more important" says the Institute, as the emergency continues.

And in Des Moines, a wholesale grocer warned canners attending the Iowa-Nebraska

(Continued on page 8)

Why the sea is salty

IN Norse mythology, a poor man got a magic mill from the elves. With it he could grind whatever he wanted--food, clothing, furniture, and best of all, gold. Of course, the poor peasant's lot changed from poverty to riches.

An envious brother borrowed the mill. He commanded it to "grind herrings and broth and grind them good and fast." But having taken the mill in such haste, he didn't know the magic words to shut it off. He was almost drowned in broth when the brother came to the rescue.

Finally, the magic mill was stolen by a salt dealer, who put it on his ship. Safely at sea, the skipper demanded, "Grind salt and grind it good and fast." Alas, he hadn't learned the control words either. The mill ground salt endlessly, filling all his kegs and his hold, covering the decks and at last sinking the ship. There at the bottom of the sea, so people say, the magic mill still grinds--and that's why the sea is salty.

From time immemorial, men have dreamed about magic mills and schemes to bring abundance and riches. Here in America, today, there are plans that are flooding us with superabundance of certain commodities. But what about the magic words to shut off the mill?

Isn't it time we see the truth in this ancient Norse myth, that "too much" is just as foolish as "too little?" We may well remember this first law of economics: In a *free* market, supply can adjust itself to demand--whether it be potatoes or steel--without sinking the ship. Here is a must job for all thinking Americans.

QUALITY
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SERVICE

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Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

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(Continued from page 6)

Canners' meeting that survival of smaller packers will depend on private label business.

Said Merrill S. Finch, vice pres. of Nash-Finch Co., Minneapolis, to the canners: National brands "become known-value items, and worth no more in one store than in another, . . . worth no more from one distributor than another, regardless of the service rendered." This, said Finch, comes from the competition among national advertisers for ever lower cost, higher volume and distribution.

Retail and wholesale distributor profits cannot grow under this system, said Finch. Result: Distributor brands.

This, said Finch, presents the smaller packer with an opportunity for volume, low sales cost, dependable outlets. But, he said, "you must learn how to pack dependable merchandise of fine quality. You must be able to deliver what you sell." And, the price must be in line.

"Some of you will fail to recognize this," said Finch. "And if you do, it will be your last chance."

★

The Convention

Perhaps the most timely meeting during the Canners Convention in Chicago, next month, will be a special War Mobilization Conference. This will take place on Saturday afternoon, Feb. 17. NCA hopes to have representatives of government agencies there to explain their various programs for the National Emergency. Included are the manpower agency, Quartermaster Corps, Economic Stabilization Admin., National Production Authority, and the USDA.

Here, in brief, is the setup for the Canners Convention. TIME: February 14-23. PLACE: Chicago.

Committees and officers of various associations will begin meetings on Feb. 14. The Machinery and Supplies Exhibits will open at the Stevens at 9 am Saturday, Feb. 17. On Sunday, they will open at noon. They will run until 6 pm every day except Feb. 21, when they will close for good at 3 pm.

Senator Harry F. Byrd, himself a progressive Virginia canner, will be the top guest speaker at the Convention. Canner Byrd, second ranking member of the Senate Armed Services Committee and also a member of the Finance Committee, will address the general session on Feb. 18.

Meeting schedule

The important events of the Convention are as follows:

Feb. 17: 10 am—General Session, Peanut Butter Mfrs. Assn., Morrison Hotel. 1:30 pm—Special NCA War Mobilization Session, Stevens Hotel. 6 pm—Dinner for State Secretaries, Stevens. 6:30 pm—Old Guard Dinner, Stevens.

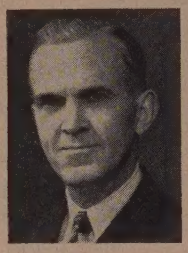
Feb. 18: 10 am—Annual Meeting, Canning Machinery & Supplies Assn., Stevens. 1:30 pm—General Session, NCA, Stevens. 1:30—Business Meeting, National Assn. of Food Brokers, Stevens.

Feb. 19: 9 am—NCA Raw Products Conference, Stevens. 9:30 am—NCA Canning Problems Conference, Stevens. 9:30 am—General Meeting, National Kraut Packers Assn., Stevens. 10 am—General Session, National Preservers Assn., Morrison. 7 pm—Young Guard Dinner, Morrison. 7 pm—Annual NFBA Banquet, Palmer House.

Feb. 20: 9:30 am—Joint Conference, NCA Raw Product and Research Laboratories, Stevens. 10 am—Technical Meeting, National Preservers Assn., Morrison. 2 pm—NCA Fishery Products Conference, Stevens. 7 pm—Annual Dinner Dance, sponsored by CM&SA, Palmer House.

Feb. 23—General Session, National Pickle Packers Assn., Sheraton.

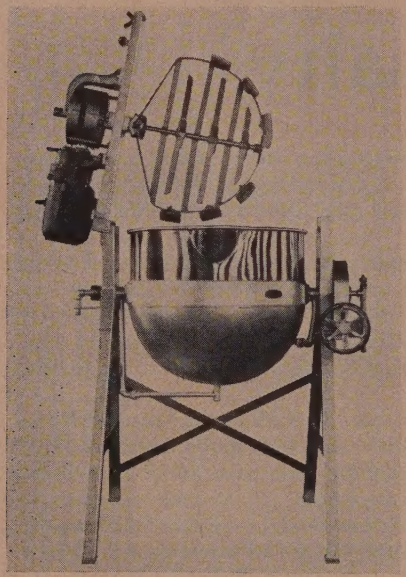
Mel Carlson New *Food Packer* Business Manager



FOOD PACKER gets a new Business Manager, effective this month, in the person of C. Melvin Carlson. Mel, a veteran of 25 years in advertising and publishing, was Advertising Manager of *The Canner* for 12 years prior to his new appointment.

Mel Carlson brings to FOOD PACKER a wide acquaintanceship in the Canning and allied industries. His understanding of Industry problems will further this magazine's planned program of broadened service. He begins his new duties Jan. 15.

Mel is an active and familiar participant in such Industry activities as the Young Guard Society and the Forty-Niners, and has served on various committees of the Canning Machinery & Supplies Assn.



WORKS 2 TO 4 TIMES FASTER!

You can bring your products to boil two to four times faster in a Hamilton Stainless Steel Steam-Jacketed Mix Cooker than in many non-agitated steam jacketed kettles. Built to ASME Specifications, Hamilton Stainless Steel mix-cookers are available with single or double action agitators. Stock specifications include maplewood scrapers, but can be furnished with soft metal or plastic scrapers guaranteed not to effect taste or flavor of product.

Extra large steam jacket and fittings, plus larger draw-off, will speed operation, cut costs. (Draw-off sizes up to four inches and larger if necessary.) Investigate the Hamilton Stainless Steel Mix Cooker and Stationary Kettles today.

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Please send complete information on Hamilton Stainless Steel Mix Cookers. D

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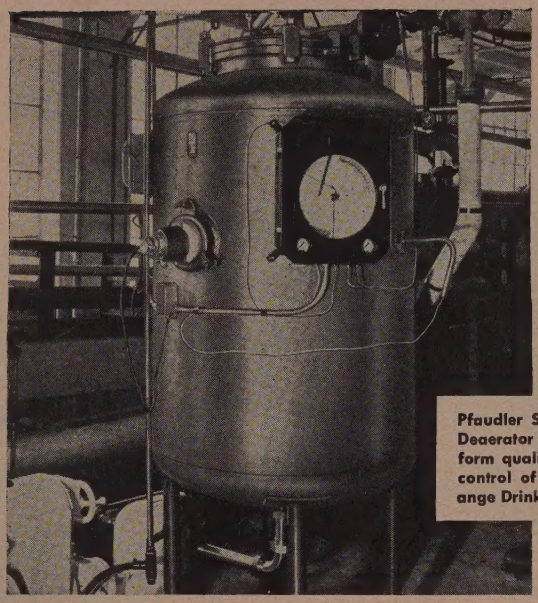
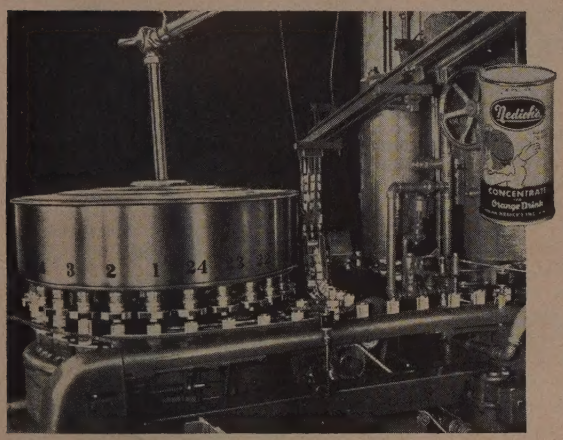
How Pfaudler Equipment Aids Nedicks

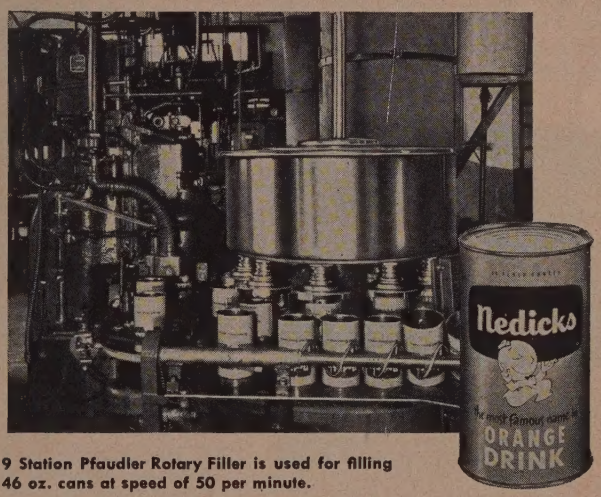
to process quality orange drink



Pfaudler Stainless Steel Deaerator is key to uniform quality and flavor control of Nedick's Orange Drink.



24 Station Pfaudler Rotary Filler where 6 oz. cans are filled at a rate up to 400 per minute.



9 Station Pfaudler Rotary Filler is used for filling 46 oz. cans at speed of 50 per minute.

Nedick's is a famous name in orange drinks, and by producing a *uniformly* good quality of orange concentrate, demand has increased phenomenally. How do they do it? The answer—fast processing!

This orange product, like all citrus juices, is quick to oxidize. Nobody wants your product after that. With the aid of a Pfaudler deaerator in combination with Pfaudler High-Speed Rotary Fillers, Nedick's has solved the problem of oxidation.

The deaerator removes the air which is so detrimental to flavor and keeping quality, just before the product is canned. A constant vacuum is maintained as juice flows through the unit. According to Mr. E. S. Hansen, Production Manager of Nedick's, ". . . tests for residual air content in the product demonstrate efficient deaeration." Result—good flavor.

Speed of handling is also essential—the reason why Nedick's uses one 9 Station Pfaudler Filler for handling 46 oz. cans and one 24 station machine for filling 6 oz. cans. These machines are noted for their speed as well as their accurate and clean fill. When you can pack as good a product as Nedick's Orange Drink base day after day, isn't it good proof of the profitability of using Pfaudler equipment and process know-how? Check for yourself. Use the coupon.

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Please send me more information about:
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Company_____

Address_____

City_____ Zone____ State_____

New packs

P. J. Ritter Co., Bridgeton, N. J., has a new idea in tomato juice containers. They are now packaging their vintage juice in a decanter bottle that can be used right at the table.

W. P. Williams, Inc., Bristol, R. I., are packing frozen broiled and stuffed fresh lobster in a carton by the Robert Gair Co., Inc., N. Y., Thomas River, Conn., Div.

Re-usable quart and one-half gallon glass decanters have been selected for "Vintage" vinegar, product of the Central City Pickle Co., Peoria, Ill. Stock decanters and metal closures manufactured by Owens-Illinois Glass Co., Toledo. For its new processed peanut butter, H. J. Heinz Co. is using this wide-mouthed jar and cartoon-type label.

production lines

new methods
new products
latest research
production ideas

National Scientific Register to list food technology personnel

A National Scientific Register is being set up by the Federal Security Agency with the help of scientific associations. The Institute of Food Technologists has accepted responsibility for the registration of personnel in the field of food technology. This applies not only to members of the IFT, but to any one in the field. IFT members are automatically registered.

Minimum qualifications for registration as a food technologist are: "At least a bachelor's degree from a recognized educational institution in one of the applicable sciences or branches of engineering concerned with food technology, plus three years experience in the application of this training in food technology operations. The requirement for formal academic training may be waived in the case of those individuals who, through long experience, have distinguished themselves in the field."

Registration is entirely voluntary. However, scientists and technologists have felt that in order to secure maximum utilization, registration should be handled by some group other than the War Manpower Board or Selective Service. There are no age limits.

Application to register should be made on a postcard sent to the Institute of Food Technologists, Executive Secretary, 176 W. Adams St., Chicago 3, Ill. Within a month a questionaire will be sent from the Washington headquarters of the National Research Council.

Frozen concentrate aids lemon industry

Frozen lemonade is shaping up as California's answer to frozen orange juice, which only Florida has been able to pack profitably in large quantities.

According to a report in the *Wall Street Journal*, frozen lemonade is strictly a California show. It first hit retail counters about a year ago. Now it's geysering from California packing houses. More than two million gallons have been packed this year.

Frozen orange concentrate was three years old before it reached 1,900,000 gallons in 1948. Next year, between six to ten million gallons of the tart lemon drink will be processed.

For the California lemon growing industry, the new juice-freezing wrinkle comes as a joyful windfall. Lemonade packers are now paying growers $70 to $95 a ton for the best lemons. In recent years, growers have been getting not more than $25 or $30 for top-grade fruit.

The growing new lemon drink could play an important role in restoring the ailing lemon-growing industry to health.

Crop cover affects orange juice quality

The composition of Washington Navel orange juice is influenced by fertilizers, as shown in field experiments with Navels on sweet orange rootstock.

In tests made by Winston W. Jones and E. R. Parker of the California Agricultural Experiment Station, Riverside, the largest percentage of juice was produced by fruit from trees with no-fertilizer treatment, but the yields were much reduced by the lack of nitrogen.

Where the amounts of applied nitrogen were equal—three pounds N per tree per year—the plots which also used phosphorus, produced fruit with slightly more juice. In the treatments without covercrop, the addition of phosphorus fertilizers increased the volume of juice 3.5% while in those employing covercrops the increase was 7%.

Ruby peppers may replace Jap Hontakas

Before World War II substantial tonnages of Hontaka chili peppers were imported into the United States from Japan each year, but these imports were curtailed in 1939. It was not until several years after the end of the war that Japanese-grown Hontakas were again available.

Small, hot chili peppers of this type are in demand as a hot spice ingredient

(Continued on page 12)

THE BEAGLE is always ready for the hunt. He is accustomed to hunting in a pack and when in action waves his tail gaily and obeys all commands quickly and cheerfully. Beagles should stand no higher than 15 inches.

In Boxes, too

The Pedigree is Assurance of Thoroughbred Stock

A "PEDIGREED BOX" results from integrated production, with quality control by one management from timber to finished box.

That's why American Sugar Refining Company uses Union boxes to provide safe packaging for Domino sugar from refinery to dealers' shelves.

75 years of undisputed leadership in paper packaging goes into Union boxes. Tremendous forest resources feed five of the largest paper machines in the world, in a completely integrated pulp-to-container plant unmatched in America for size and production. And four modern box plants, strategically located, serve you promptly and dependably.

Add all these *extra* assurances of consistent quality, dependable service and fair price and it's easy to see why every month more makers of national brand products are shipping in Union boxes.

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Dependable Packaging Since 1872

UNION Corrugated Containers

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Corrugated Container Plants: SAVANNAH, GEORGIA • CHICAGO, ILLINOIS • TRENTON, NEW JERSEY

production lines . . .

(Continued from page 10)

in many foods; they are also used for their deep red color which adds much to the appearance of glasspacks such as olives and pickle products. Certain processors use them to flavor stews and soups.

Gentry, Incorporated, now has produced a plant whose fruit is similar to the Hontaka chili peppers. These peppers have a deep ruby-red color, an average length of about one and one-half inches, and plenty of bite or heat.

Quartermaster speeds ration production

The one millionth package of C rations coasted off the "pilot" assembly line two weeks ahead of schedule at the Chicago Quartermaster Depot. Packaging of the C-6 ration was begun at the depot, commanded by Brigadier General Everett Bush, early in September with a target date of mid-November for the millionth ration assembled. Actually, the run was completed November 3.

Working under pressure of time as a result of the Korean war, the assembly line was expanded to meet ration requirements until the food industry could assume the major task of packaging combat rations. The "pilot" line is maintained permanently by the Chicago Quartermaster Depot for purposes of cost control and ration research and development. Output of the assembly line is 70 complete rations per minute with six different menus as called for in the C ration.

Can production up 14% for first six months

The manufacture of cans for food increased by one-half billion units, or about 14%, during the first half of 1950 over the comparable period a year ago, L. W. Graaskamp, vice president in charge of sales for the American Can Co., reported recently.

Increase in the output of food containers was over 500,000,000 units. The biggest single volume jump in food cans was recorded for fruit and vegetable containers, including juice cans.

Locker plants increase processing services

Customers of many freezer locker plants are now being offered fruit and vegetable processing services, according to agricultural engineers of the USDA. Continuing success of experimentally developed locker plant processing kitchens, as well as the increased interest of other plant operators points to more widespread services of this kind.

The service keeps lockers rented for the freezer plant operators. They sell more cartons, have a greater demand for sharp freeze service and keep their overflow bins filled. Further profit is added by offering fresh fruits and vegetables for sale to customers for processing, and by selling food put up by the operators, themselves, in their kitchen.

Study problems of unprotected inventor

Few persons are aware of the difficulties created for corporations by the absence of patent protection covering a new idea that is offered for sale. Fewer yet understand the reasons behind the waiver so commonly demanded from would-be sellers of unpatented ideas or products. A small number of firms have evolved satisfactory techniques of dealing with the unprotected seller to retain his freindship and respect.

A recent study of the problem by the Packaging Institute shows that it is almost impossible for the holder of an unpatented package, product, or idea to get a hearing in any large corporation without signing a waiver. This much is fairly well known. But the various methods of

(Continued on page 14)

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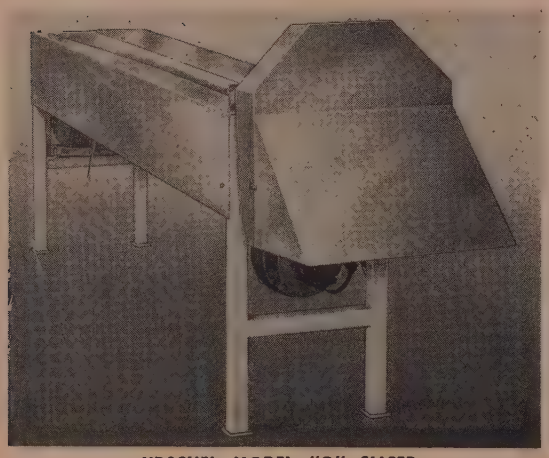
. . . uniform size and thickness



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The Urschel Model "O" Slicer, featuring a special discharge pork chute—

- **cuts warmed or chilled material.**
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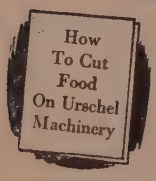
- **assures flavor uniformity.**
- **reduces hand labor at least 75%.**



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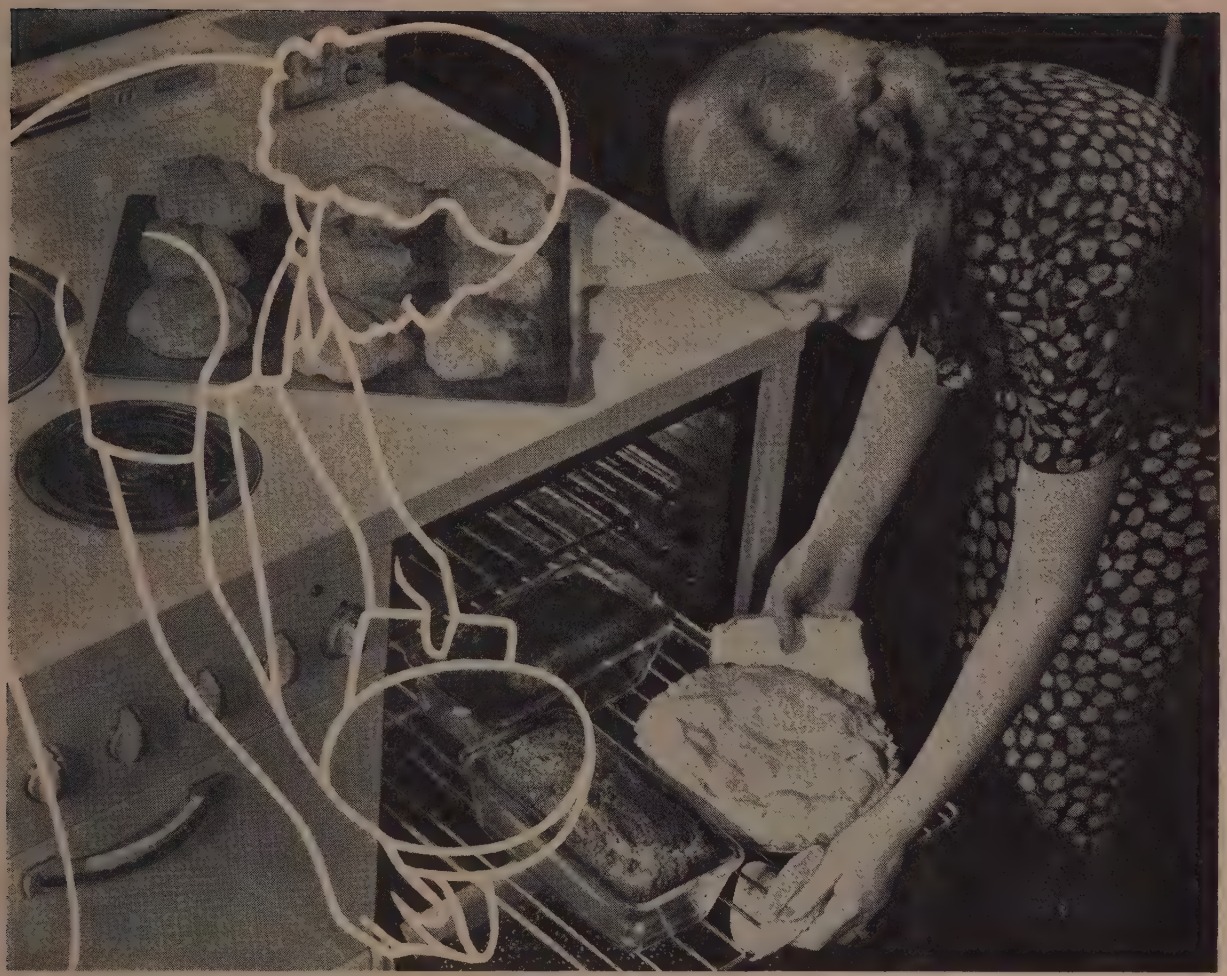

What's she doing in my kitchen?

Sorry if we startled you. But, actually, the lady has been in the kitchen of millions of American homemakers for years.

For she personifies another American Can Company service designed to increase business for canners. We call it:

Advice on Recipes and Consumer Preferences

These recipes, of which American Can Company has prepared hundreds for customer's labels, provide canners with a means of encouraging increased purchases by demonstrating the variety of attractive dishes which may be prepared from their canned foods.

This is but one aspect of the service. For instance, each year American Can Company distributes thousands of recipe booklets for use in schools and colleges for instructing students in the art of preparing economical and nutritious meals from canned foods.

And, Canco's home economists keep close contact with consumer groups to determine current preferences and trends in the canned foods market.

If you are a Canco customer, you know the value of this service. You also know that it is only one of many. Here are a few others:

1. **Advice on crop production problems**
2. **Prompt help for production emergencies**
3. **Best facilities anywhere for delivery any time, in any amount**
4. **Advice on label design and information**
5. **Advice on food processing**

Canco offers more and better service than any other can manufacturer.

AMERICAN CAN CO.

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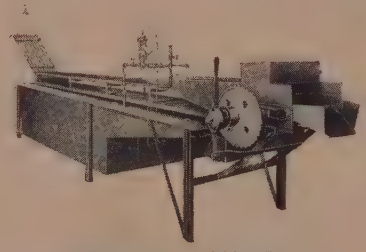
See You In Chicago . . .

The 1951 National Canner's Convention promises to be one of the greatest ever! And one of the major purposes of the exposition next month is to provide the canners of America and the managements of machinery manufacturers to meet and discuss their mutual business problems.

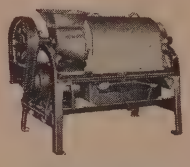
We'll be at Booth No. 68, in the foyer of Machinery Hall, and we hope you'll stop by and visit with us. Our exhibit will feature the famous Langsenkamp equipment that enables today's canners to obtain greater yield, higher quality, better profit! Equipment that pays for itself through savings . . . oftentimes as much as three times over in one season.

So look us up at Booth 68. We'll be there with our entire management staff at your disposal. See you in Chicago!



HOT WATER SCALDER

HOT-BREAK TANK



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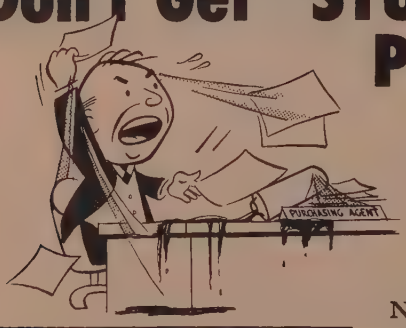

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production lines . . .

(Continued from page 13)

handling the would-be seller are little known and range all the way from a gracious acknowledgment and refusal to examine an offer without a waiver to a brusk return of any proferred items or papers with a flat statement that they are unread and not wanted. Some companies go so far as to state they refuse to consider any uninvited ideas from outsiders.

Chief value of the report, beyond its survey of the field, lies in the reproduction of the text of letters used by some of the best known companies to cope with the vexatious problem of the unpatented idea. Copies of this report are available at $5.00 each from the Packaging Institute, 342 Madison Ave., New York.

Spoilage prevention chart for 28 packs

A chart titled "What's Wrong" has been developed for determining symptoms of quality breakdown for 28 packs. Causes of product spoilage are also included in the chart, which appears in the special Processing Digest edition of *Food Packer*. The chart begins on page 144 in the edition that was issued September 15, 1950.

Chemical treatment for cannery waste waters

A new chemical compound for treatment of cannery waste waters, and elimination of accompanying odors, is arousing interest in the Midwest. Developed by W. W. Cook, Rankin, Ill., the new method is said to be 30-50% less costly than sodium nitrate treatment.

Mr. Cook has been working with several large canning companies, and independents, in Indiana, Illinois and Wisconsin for the past 1½ years. Results are said to have been such that local newspapers have commented on improved odor control. In one case, a city council wrote to a local plant, commending the company for eliminating offensive odors.

Equally important, the new compound is said to be far superior to sodium nitrate in holding down the B. O. D. load in waste waters and simplifying the problem of stream pollution.

Mr. Cook told Food Packer that, in an average lagoon, one 55-gal. drum of his compound is a proper dosage for 700,000 gal. of waste water. In quantities required for cannery waste treatment, the chemical is non-toxic.

The new product also has been used successfully for deodorizing pea vine stacks. Here, it is sprayed lightly on the

outer surface of the stack. Mr. Cook flatly states that his product is by far the most effective deodorant yet used for this purpose.

Mr. Cook is now associated with the Warren Refining & Chemical Co., in its Midwest Division office, 185 N. Wabash Ave., Chicago. He plans on contacting canners visiting the Convention in Chicago next month.

Frozen beans lose vitamins when exposed

What happens to the niacin and riboflavin in green beans packaged for freezing? Nothing, if they are stored immediately.

According to a report by Eunice Kelly, human nutritionist, North Dakota Agricultural Experiment Station, Fargo, even after six months storage there will still be as much niacin and riboflavin present in the beans as there was immediately after blanching and packaging.

However, approximately one-seventh of the ribofiavin and one-fifth of the niacin content are lost during blanching for freezer storage.

But this is important—those packages of blanched beans that were left at room temperature for 24 hours turned grayish in color and had a definite stale odor.

Pectic materials in tomatoes identified

Food chemists at the New York Experiment Station, Geneva, have measured and identified the different pectic materials in tomatoes. These include the substances which play an important part in the texture and firmness of both fresh and canned tomatoes and which also affect the consistency of tomato juice, puree and paste.

Although the total amount of pectic substances in mature tomatoes has been determined, little has been known about the pectinic acids which make up the bulk of the total pectic constituents, according to Drs. Z. I. Kertesz and R. J. McColloch.

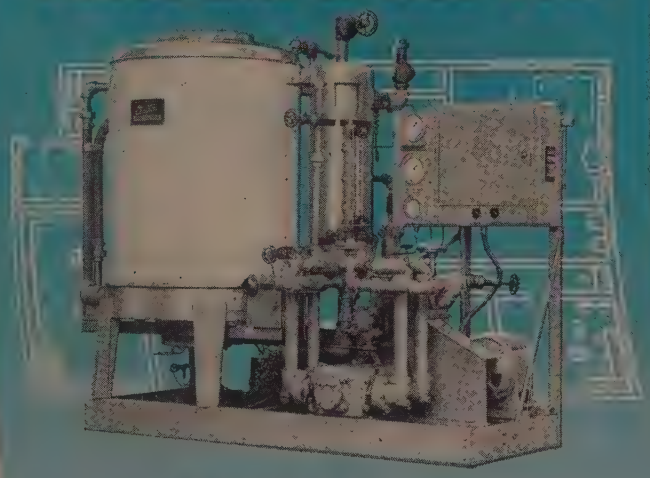
Fruits were analyzed at various stages of maturity. No significant differences in their pectic make-up could be associated with maturity, and the deepness of the red color was found not to be an entirely reliable indicator.

Cathode rays preserve without refrigeration

Foods have been preserved for periods as long as a year without refrigeration, as a result of bombardment with 800,000-volts electrons, or cathode rays, in experiments at the General Electric Research Laboratory. The rays kill molds and other organisms which normally

(Continued on page 16)

MORE STEAM
Faster and at Less Cost



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The Clayton *Forced Recirculation* Steam Generator...in sizes from 15 to 100 h.p., and equipped to burn gas or oil, or both...is a compact, self-contained steam plant ready to install and operate as it is delivered. No accessories to buy. No stack, bricking or foundations to install. Move into place; connect fuel and water lines, electricity and vent, and the Clayton generator is ready to operate. Occupies 30% to 70% less space than conventional boilers of same capacity.

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production lines . . .

(Continued from page 15)

cause such foods to spoil.

Elliott J. Lawton of the GE lab stresses that his findings resulted from experimental work and that it is too early to predict commercial applications. However, sterilization by cathode rays should be particularly attractive for materials which would be damaged or destroyed by the heat required to sterilize them with usual methods. Absorption of a germ-killing dose of electrons raises their temperature only slightly.

Overproduction threat to citrus industry

There is a distinct note of optimism for producers in the fresh citrus industry despite the rapid advances made by orange concentrate, Paul S. Armstrong, manager of the California Fruit Growers Exchange, told Sunkist growers in his recent annual report.

Biggest potential threat to citrus producers is apparently not the concentrate business, but overproduction. While growing of apples, plums, prunes, melons and importing of bananas has actually decreased since 1930 and peaches, pears and grapes have shown raises of from only 7-29%, citrus production has increased 143% in 20 years.

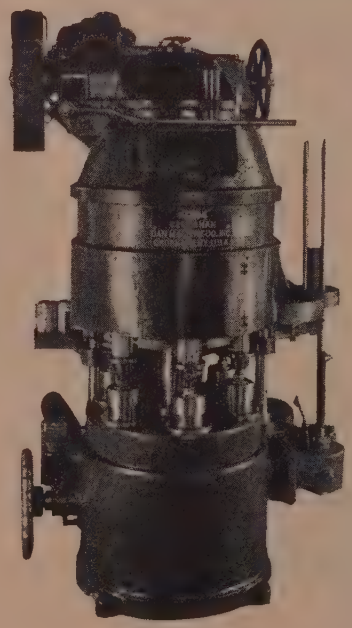
During 1949-50 Sunkist supplied 380,000 tons, or about 22,000 carloads of fresh fruit (oranges, lemons and grapefruit) for processing to the two large plants affiliated with the Fruit Growers Exchange.

Favor easing Mexican labor regulations

In order that California agriculture have sufficient field labor in 1951, some changes are necessary in the present method of recruiting Mexican nationals, Ellis S. Coman, manager of the agricultural production labor committee of Los Angeles, told the Western Growers Association recently.

Only about 7,000 Mexican nationals were used in the state last year, most of them close to the border, compared with 30,000 in 1946. Estimated requirements of nearly 35,000 out-of-state workers are expected in 1951.

Western Growers Association has passed a resolution requesting the U. S. departments of state, labor and immigration, and the California state employment service to make every effort to secure necessary labor from Mexico, and particularly urged that the 1951 program be set up with the minimum of regulations.



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Also supplied with cannery feed.
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No can, no end device.
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Even the fillets and steaks of "fast-rusting" pink salmon can be protected against color and flavor loss with a Pfizer Ascorbic Acid dip. Treated this way, perishable frozen salmon, halibut, mackerel and tuna stay bright and tasty . . . command top prices.

This vitamin-antioxidant is easy to incorporate in your normal processing procedure whether you use hand-dipping, brining tanks, half cylindrical tanks with paddlewheel or troughs with elevating belt. Fillets may be dipped briefly in an 0.5% to 2.0% solution. A reduced strength solution of 0.25% to 1.0% is suggested when a thickening agent is added to prolong contact. Even lower percentages of ascorbic acid are possible when citric acid is included in the dip.

For top quality, always specify Pfizer Ascorbic Acid. This pure, crystalline product is widely used throughout the food industry to preserve frozen peaches and apples, and to fortify fresh fruit juices and certain new dairy products. For further information, samples and prices, just drop us a line.

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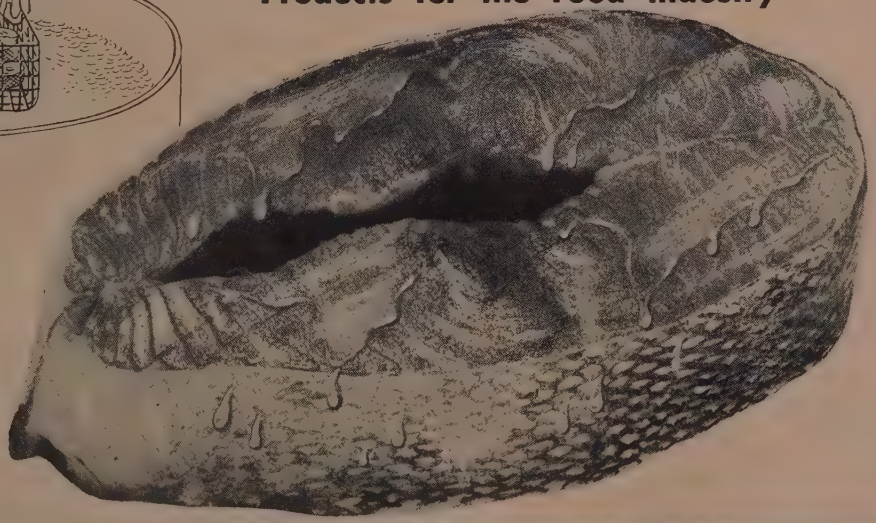
Products for the Food Industry



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Leaves For A Canner's Notebook

PRINTED AS A SERVICE TO THE FOOD PACKING INDUSTRY BY CONTINENTAL CAN COMPANY

WATER FOR CANNING

No. 11

Conserving Canning Water

(For copies of this complete series, please write to Department A, Continental Can Company, 100 E. 42nd St., New York 17.)

In some parts of our land, particularly in the West, water supplies are critically low, and in many other areas dwindling supplies pose threats of future shortages. The conservation of water is fast becoming a necessity for the continued operation of canneries in such locations.

Water saving procedures are no innovation in the industry, yet have not commonly been practiced in very many plants. Necessity has forced development of methods, however, and there are several basic procedures for saving water which may be applied safely in the average cannery. These relate to: the elimination of waste through efficient equipment design and operation, the use of mechanical conveying systems instead of water flumes, and the recovery, treatment and re-use of water in certain cannery unit operations.

The saving of water that may be accomplished by the elimination of water flumes and the use of mechanical conveying systems is obvious. Where necessary or desirable for reasons of efficiency and cost to use water fluming for raw materials, water consumption may be reduced by the recovery and re-use of a portion of the flumic water. This procedure and its limitations are described in subsequent paragraphs.

Saving water through improved equipment design is largely a theoretical consideration, but does offer some practical possibilities. Selection of equipment in part for its water saving attributes, and care in avoiding wasteful operation can effect substantial water savings. Hoses and other water lines can be equipped with automatic shut-off valves. High pressure sprays use less water in clean-up than low pressure lines. Excessive and continuous overflow from soaking or washing tanks may be avoided. Continuous water flow in flumes, washing reels, sprays and similar equipment when not handling product creates wasteful water use.

Recovery of water from various cannery unit operations, treatment to render it safe, and subsequent re-use in the cannery offers a means of effecting considerable water economy. Indiscriminate re-use of water, however, without consideration as to its effects upon product quality, sanitation, or spoilage of the canned food, could lead to disastrous loss. In many unit operations only fresh potable water may be used. Water from some operations cannot be recovered for re-use in any part of the cannery. The use of recovered water is limited within the plant, both as to source and intended re-use. In addition, there are several precautionary measures that must be taken for any water recovery and re-use.

All water recovered and intended for re-use in either the same equipment or in other operations should be chlorinated. This is particularly important for water intended for re-use in can cooling equipment, to prevent excessive bacterial build-up and resulting spoilage of processed cans. It is also important for water re-used elsewhere, to prevent equipment contamination and for observance of general good sanitary practices. Careful control is necessary to insure maintenance of adequate chlorine residuals. All recovered water must be handled in separate systems of piping and pumping, clearly identified by color and signs, and *extreme care must be exercised to avoid any connection with the potable water supply.*

Removal of as much organic matter as possible by screening of water at recovery is advisable. Furthermore, fresh unused replacement water must be added to treated recovered water in any equipment to which it is added. The volume of replacement water used must be adequate to prevent the accumulation of undue amounts of organic material.

Water which has been treated with any kind of corrosion inhibitor may not be re-used for any purpose except cooling cans. For canning products which are discolored by iron, recovered water presents the potential hazard of build-up of dissolved iron. Excessively high iron content may also play a contributing part in "black beet" spoilage.

There are several unit operations commonly used in canning almost all types of products to which water saving measures may be adapted. The extent to which water economy may be practiced in these operations is limited by the necessities of quality, sanitation and spoilage prevention.

Fluming of various materials often consumes large quantities of water. Waste material may be flumed in any previously used water. Raw products may be conveyed in flumes using water recovered from spray can coolers, or from retorts used for batch cooling of processed cans, provided the water is cool and free of organic matter. Products in the process of preparation, which have been peeled, cut, washed, blanched, or subjected to any preparation process, should be conveyed in *fresh water only.* These provisions apply also to water used in hydraulic elevators. In general, water recovered from flumes and hydraulic elevators may not be re-used elsewhere, except that a portion may be used again in the same equipment.

Washing of products presents possibilities for water economy. Water recovered from spray or retort can cooling may be used in preliminary raw product washers. Only fresh water should be used for final washing of products which have undergone preparation processes. Where successive washers are employed for raw products, water from the second may be recovered for re-use in the first washer. For purposes other than this, wash water should not be re-used. Low temperature is a requisite for water intended for use in washing, to prevent bacterial build-up and consequent product contamination. Wash water from products such as tomatoes which are subject to mold development in the raw state, or those likely to bear insects, such as spinach, probably cannot be re-used for first washing because of the extreme danger of contaminating products subsequently handled in the same equipment.

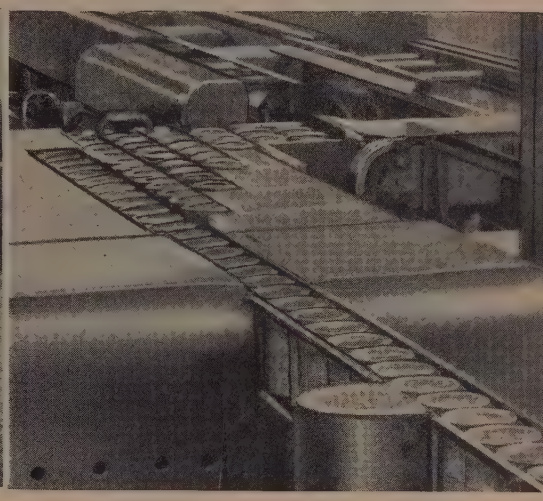
Blanching should be done only in fresh water. Although pipe blanching equipment recirculates hot blanching water, a copious supply of fresh potable water is required for continued operation, and the overflow water cannot be used for any other plant operation except waste fluming.

Soaking and Holding require fresh water only. Spent water from such operations should not be used in any other plant process except in waste conveying.

Cooling of cans after processing requires water of low microbial content, but chlorination makes possible the safe re-use of cooling water under certain circumstances. For cooling canals only fresh potable water should be used in the initial charge. Water from the hot end of the canal may be withdrawn for cooling and re-use in the canal, provided it is carefully and adequately chlorinated, and the cooling equipment and canal are maintained in clean condition. It is also necessary to provide a continuous supply of fresh potable water to the system. Water from cooling canals should not be re-used elsewhere in the plant except for waste fluming. The recovery and re-use of water from continuous cooling equipment in which cans are partially immersed in water is governed by the same limitations that apply to cooling canal water. Water recovered from spray coolers may be re-used in the same equipment, or may be used for other unit operations as described above. Chlorination before re-use is recommended. Cans to be cooled in equipment from which water is recovered for re-use should be washed thoroughly immediately after closing, in order to remove adhering organic material.

Cleaning up a plant and equipment may be performed in part with recovered water from spray and batch retort can cooling. Such water may be used for preliminary washing if it is adequately chlorinated. Only fresh water should be used for the final washing.

YOU CAN'T BEAT CONTINENTAL AS A DEPENDABLE SOURCE OF SUPPLY



Hi-C orangeade (46 oz. tins) is handled in new Packomatic machine. At right is closeup of cans entering end-opening case.

End-opening case

New shipping case, automatic loader-sealer, reduces Juice Industries' packaging costs

COST OF CASING institutional and large juice cans is being lowered by using the cheaper "end-opening" shipping cartons and a recently developed automatic loader and case sealer. Juice Industries, Inc., Dunedin, Florida is casing 46 oz. citrus juice cans as fast as 240 cans per minute. This firm is a division of Clinton Foods, packing single strength Hi-C orangeade as well as Snow Crop concentrated orange juice. This package line was suggested and designed by J. L. Ferguson Co., Joliet, Ill., manufacturers of Packomatic equipment.

The end-opening shipping case is not new, having been first used for cereal packages. While not in general use on canned foods, it is being given serious consideration because of its several economies. Improved methods of automatically packing, glueing and sealing this type carton, as pioneered by Ferguson, should greatly increase its popularity.

There are several advantages of the end-opening case over the conventional top and bottom opening style. Most important is price—using less paperboard. This saving alone may run anywhere from 5-30%, since the most economical container has the smallest opening. The entire saving is not reflected in the sale price because a longer strip of tape or more staples are required at the joint.

A simple formula that any packer can use to answer the question, "Will there be a saving if I use an end-opening case?", is as follows:

D+W+1″ × 2L+2W+1″=sq. in. of board. D is the distance between the two openings, L is the longest measurement on the opening side of case with W as its width. Although the case may appear to have the same outside dimensions, the flaps should be on the smallest side—less double thickness of paperboard and lower final cost.

Transit damage lowered

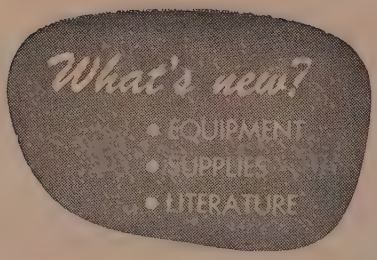
Greater strength is possible during transit, if these end-opening cases are made with corrugation running the long way. When flaps are closed, the corrugations serve to increase the strength of the ends of the case, thus adding to the stacking qualities. This type case has greatest strength at the corners, where the flaps combine to give added resistance to weight and shock. During transit most of the damage occurs from rough handling, and shock is nearly always from end to end. Thus in loading, if the car is loaded with ends of the cases in each tier facing the ends of the car, the possibility of damage in transit can be lowered.

End-opening cases are easier to handle. They stack better because they have a flat, smooth surface, rather than bulk on the ends that are sealed. Thus there is less tendency for the stacked cases to tip and fall because the sides are smooth and flat.

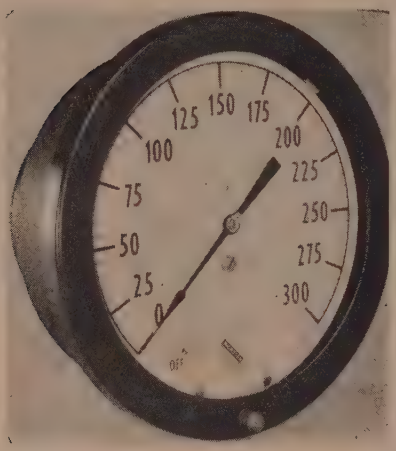
At Juice Industries the stacked cases come to the packing line on skids and are loaded directly into a combination Packomatic carton opener, loader and side gluer-sealer. At the loading position this machine feeds out, opens and squares the shipping cases into position.

Simultaneously the filled juice cans are conveyed to the loader in a single row. The cans are collected in a special pocket as shown in the illustration. With one stroke a plunger pushes the dozen cans into the case. This assembling is done so smoothly that damage to cans and labels is practically eliminated. Both the carton handling and can assembling operate at speeds up to 240 juice containers per minute.

The loaded case is conveyed, while on its side, directly through a horizontal-type gluer and sealer. Since the case is loaded in a horizontal position it, therefore, is more easily closed at this angle. As many as 20 cases can be handled per minute.



Temperature indicator



This electrical instrument is capable of measuring temperature between minus 100°F. and plus 3000°F.

The power actuation and construction simplicity of these instruments supplant the delicate and fragile works of millivolt pyrometers and eliminate the need for slidewires, standard cells, delicate moving contacts, or complicated mechanisms found in the more costly types of potentiometers.

Developed by: Manning Maxwell & Moore, Inc., Bridgeport 2, Conn.

Protective flooring

These floors are acid, alkali, and leakproof. Designed especially for food processing plants, they are completely resistant to fruit acids, sugar syrups and strong detergents.

The floors are tailor-made to meet individual service conditions, and have the approval of health and sanitation authorities.

Bulletin on request from: Nukem Products Corp., 111-119 Colgate Ave., Buffalo 20, N. Y.

Pumps catalog

A full line of pumps for handling corrosive and non-corrosive liquids, solids-carrying liquids and dry and semi-dry materials is presented in a new catalog.

Catalog available upon request from: Yeomans Brothers Co., 1433 N. Dayton St., Chicago 22.

FLASH HEAT

Now fluids can be sterilized and cooled in a split second

With this new system, flavor damage is cut, fluids are heated higher, cooled faster than ever before. It may spell better quality for such canned and glassed products as vegetable and fruit juices, purees, soups, concentrates, flavors, syrups, milk products. First of two articles.

By A. H. BROWN
M. E. LAZAR
T. WASSERMAN
and W. D. RAMAGE

Western Regional Research Lab., U.S.D.A., Albany, Cal.

IT IS SOMEWHAT suprising that direct steam injection has not been employed extensively in the application of high-temperature, short-time heat treatments for stabilizing food products with minimum flavor damage. Steam injection is in common use for heating fluids in tanks, and for heating flowing fluids in devices such as steam-water mixing tees. More than 20 years ago, Grindrod filed application for patents relating to the sterilization of liquiform food products by direct steam injection.[1] Specific effects were attributed to the use of steam jets. The value of "high-short" processes for effecting sterilization with minimum flavor damage was clearly recognized.

McClatchie patented a method of sterilizing evaporated milk by direct contact with steam as a step in canning the evaporated milk.[3] Marquadt and Yale described experiments in the pasteurizing of milk by direct steam injection. They stated specifically that the idea of heating milk by direct steam is not new, and that dairy engineers are well agreed that the idea is sound.[2] Stumbo's recent studies on the destruction of bacterial spores at higher than ordinary processing temperatures are an indication of continued interest in high-temperature, short-time heat treatments for stabilizing food products.[6]

The inherent possibilities for controlled, short-time, continuous heat treating of fluids in systems employing direct steam injection seem not to have been fully appreciated or recognized. Direct steam injection appears to be an essential element of practical systems developed at this Laboratory for extending the heat-processing range to higher temperatures and shorter times than are now in commercial use.

The systems incorporate a direct steam injection heater which is capable of heating fluids, including purees as well as juices, to temperatures in excess of 300°F. in 0.5 second or less, and to do so in the absence of solid heat-transfer surfaces, thereby reducing fouling to an insignificant problem with most materials.

Two applications

Two fundamental types of practical processing systems are the direct outcome of the application of the steam-injection heater. The first type, in which the injection heater is the sole source of heat added during processing, is primarily a heating system in which vaporization is incidental to the processing operation, or the amount of vaporization effected is not large. The second type is primarily a vaporizing system which incorporates the injection heater as a preheater or superheater for a single-tube, steam-jacketed evaporator. This system is designated as the "combination evaporator."

The injection heater alone has been used successfully as the primary component of systems designed for operations such as pasteurizing, sterilizing, and inactivation of enzymes, and as a preheater in operations involving partial vaporization for the purpose of deodorizing, deaerating,

or stripping of volatile flavor components. The combination evaporator performs all the functions of the injection heater, and in addition is a useful, rapid, single-pass concentrator. The combination evaporator is much more flexible in operation than the injection heater alone, because heat added by the injected steam and by the tubular evaporator section may be controlled independently to a large degree. Tests of the systems indicate a versatility which justifies publication of preliminary findings in advance of an exhaustive study of the inherent characteristics and potentialities of the devices.

Experimental tests

Both the steam injection heater and the combination evaporator have been studied extensively in this laboratory as components of systems for recovering volatile flavors from fruit and vegetable juices and purees. Apple and grape juices and purees of apple, apricot, berry, peach, and pear have been stripped to recover volatile essences for return to various fruit products. In all cases, the volatile essences obtained were of an initial quality comparable to that of the feed material; neither the essences nor the stripped residues had cooked flavors which were detected by casual tasters.

The largest operation conducted in the equipment involved stripping of essence from apple juice during preparation of frozen apple juice concentrate by the method described by Walker, *et al.*[7] Thirty-five hundred pounds of apple juice was stripped in the combination evaporator during a 12-hour period of continuous operation at approximately atmospheric pressure. Both essence and stripped juice were recovered substantially without alteration. A formal taste panel found no significant difference in flavor or

(Continued on page 38)

Workings of steam injection

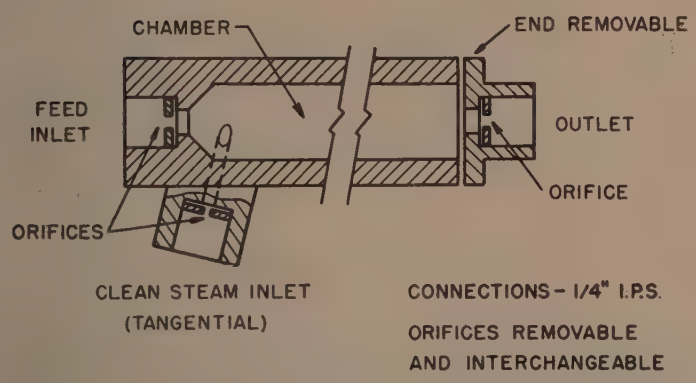
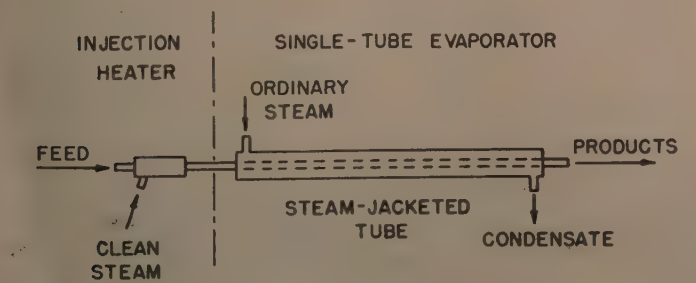
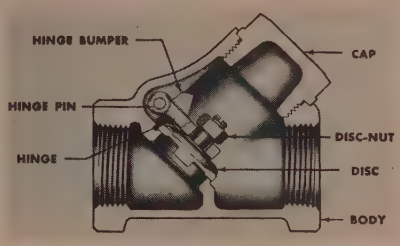


Fig. 1, above, shows operation of steam injection heater described in article on this page. Model shown has chamber diameter of ¾" and length of 6" to provide fluid retention time of 0.8 second at processing rate of 50 gallons per hour. Fig. 2, below, shows heater combined with evaporator, in which high heat transfer rates are attained by high-speed flow of fluid. In combined system, product retention time is less than 1.5 seconds.



What's new?

Swing check valves



A new line of Y-pattern swing check valves has been announced. The valves, of the regrinding type, are in the 200 and 300-lb. pressure classes.

A large cap opening on the same center line as the seat opening permits easy access for regrinding or replacement of parts. Contours in the Y-pattern body offer minimum resistance to flow. Closure on backflow is fast and positive. The check valves can be used on lines where flow is horizontal or upward.

Available from: Crane Co., 836 S. Michigan Ave., Chicago 5.

Loading ramp

The "One Man Bridge Ramp" is designed for use with fork lift trucks on railroad sidings. It has a load capacity of 15,000 lbs. and can be placed and secured by the truck operator alone in less than two minutes. Lift handles drop into place providing a flush riding surface. Locking pins, fixed in floating arms, secure the ramp firmly in place.

The riding surface is non-slip steel plate reinforced with shock plates at corners. Side stringers act as a safety guard.

Available from: Elizabeth Iron Works, Inc., Elizabeth, N. J.

Flexible tubing

A "flexible-glass" tubing has been introduced for handling of food products.

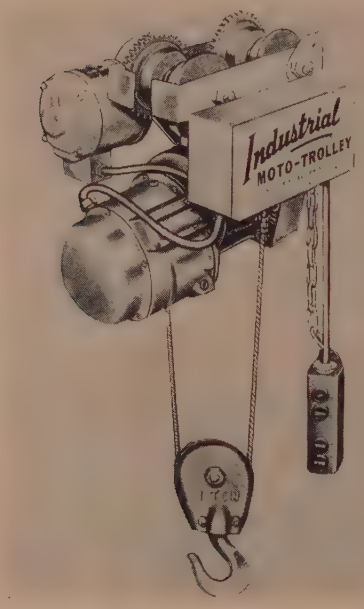
It is called Tygon Tubing, and is made of chemically inert plastic. This tubing is non-toxic, and won't absorb or impart flavor.

The complete story of Tygon Tubing is told in bulletin T-77. This booklet gives data on the physical and chemical properties of the various formulations of the tubing, lists all standard sizes (ranging from .120" to 2" ID), gives pressure ranges, coupling methods, and shows applications.

Developed by: The U. S. Stoneware Co., Akron 9, Ohio.

What's new?

Motor driven trolley



The Moto-Trolley is designed for attachment to standard lug-mounted electric hoists for low cost operation. It can be adjusted to accommodate a wide variety of beam sizes.

The trolley is powered by a crane-duty totally enclosed motor of 30 minute, 55° rating. The magnetic contact panel is equipped with a transformer to reduce the voltage in the single speed push button control circuit. A four button station controls the single speed trolley and hoist motions.

Manufactured by: Industrial Equipment Co., 315 N. Ada St., Chicago 7.

Prevents can rust

The new chemical VPI (vapor phase inhibitor) is a patented volatile corrosion inhibitor. It is a simplified, highly effective corrosion barrier that is more than just a non-corrosive paper. VPI Wrap is a complete rust-preventive packaging method.

A sheet of VPI No. 310 in between the top and bottom layers of the can takes care of the rusting which occurs by trapped moisture formed in the pocket between layers and of course, other vapors permeate throughout the case and lend a measure of protection.

Three sheets of VPI in a case, one at the bottom, one between the cans and one at the top insure having adequate VPI to do a protective job.

Manufactured by: Angier Corp., Framingham, Mass.

GLASSPACKING

Redesigns pickle line to increase capacity 125%

By installing continuous processing, Mt. Olive handles fresh pack pickles in 45 minutes

By JOHN M. GREGORY

REDUCING THE PASTEURIZING-glass-packing cycle for fresh pack pickles from two hours to 45 minutes has been accomplished by the Mt. Olive Pickle Co. of Mt. Olive, N.C. Increase in quantity handled also became apparent in the change-over to a continuous production line. According to General Superintendent Harry Kraft, the increase has amounted to as high as 125% of former capacity.

The new line was possible by adapting post-war machines to recent studies on heat and natural yeast behavior with cucumbers. Because of the success of this process, the company's entire production (10 million jars a year) is devoted to it.

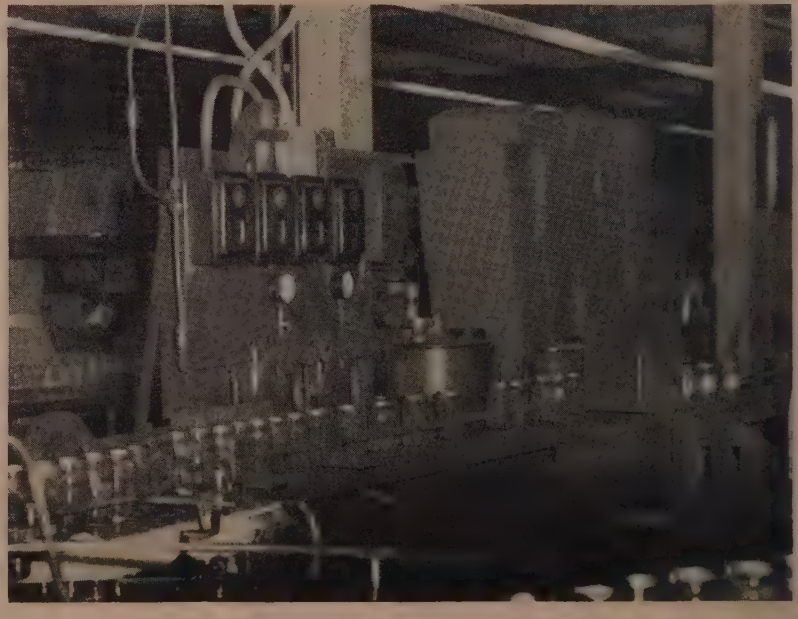
As far back as 1941, Mt. Olive began trial runs of fresh pack dills using a vacuum closure. After filled jars of cucumbers were sealed, they were placed in baskets for retorting and pasteurized with hot water and steam, using no pressure. Cooling was done while the jars were still in the retort. Removed from the baskets, the filled jars were placed in shipping cartons.

All these operations were by hand, requiring about 12 men, not including those engaged in warehousing. Besides the added labor costs, there was a loss of time tending toward lowering product qaulity.

The following year production was upped to 1900 cases a day. Although pickles were packed into jars by hand, they were brined and vacuum sealed by machinery. A crane was also added to carry a filled basket to the retorts. When pasteurized, the baskets were lifted by crane to new cooling retorts. Lift trucks were added to carry the jars to the capping and labelling operations.

A continuous pasteurizing method was installed in 1946. Upon arrival at the plant, the cucumbers are conveyed into one of two soaking vats. These vats are used alternately, one being filled while the other is emptied.

Filled jars are conveyed from the pasteurizer to the new Label-Dri machine where labels are applied at the rate of 300 jars per minute. The drum heats each thermo-plastic adhesive label to 375°F. before application to jar.



Fresh pack pickles emerging from the 85 ft. pasteurizer. The jars move down side of the unit to the new labeling machine illustrated on previous page.

When ready for processing, the cukes run through an American Specialty spray washer, where they receive a water spray of 250 pounds pressure. After a thorough wash, they are put into wilting tanks.

From the tanks the pickles are ready to be graded and glasspacked. When the jars are filled with pickles, spices and brine, they pass under a headspacer which makes an air space in the top of the filled container. The capping machine displaces the air with vapor, almost putting on the cap simultaneously. As the vapor condenses, a vacuum is created. The briner, headspacer, and capper are made by the White Cap Co. Then the jars pass through a washer where remains of the brine are removed.

Next a conveyor takes the jars to the continuous pasteurizer, which is 85′ long and 6′ wide. Columbus Conveyor Co. made the unit. Steam enters through pipes along one side with temperature recorded and controlled by Taylor instruments. A stainless steel belt carries the jars through four steam chambers of varying degrees. The highest temperature is 190°F for sweet "fresh-pack" pickles. Each style requires different temperatures.

Heat-seal labels

From the pasteurizer, the jars are conveyed to a new type labeller made by the New Jersey Machine Co. Called the Label-Dri, this machine takes dry labels from a box by air suction to a revolving drum which is heated to 375°F. The unprinted side of the label, which has been coated with thermo-plastic adhesive becomes soft at impact of heat. Labels are pasted on an exact spot on every jar, giving a uniform appearance.

Inspectors are grading cucumbers into four sizes required by Mt. Olive Pickle Company. Cucumbers are picked in the morning, ready for shipment as pickles before sundown. Conveyors made continuous handling possible.

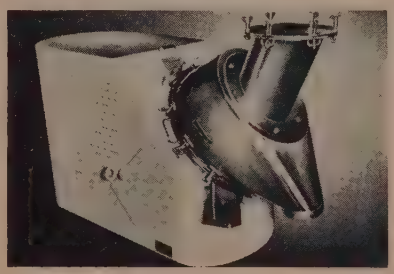
What's new?

Spoilage consultants

A new scientific service is available to advise and eliminate spoilage and contamination of canned, glasspacked and frozen foods. This service also has the facilities to improve products and to settle Food and Drug conflicts. These scientific technicians can also diagnose causes of disappearing profits in food production.

Available from: Wells Laboratories, Inc., 28 Concourse E., Journal Sq., Jersey City 6.

Angle disintegrator



A new angle disintegrator has reduced the possibility of contamination in disintegrating, mixing, blending, pureeing, homogenizing and similar operations. The machine is designed for applications requiring equipment that lends itself to immediate and complete demountability of working parts. A major feature of the new machine is the design factor which makes it impossible for lubricant to admix with the throughput.

This disintegrator retains the dual discharge feature through which resistant material is separated from the primary product and passes by gravity through the hammers and out the secondary discharge.

Further information and brochure from: Rietz Mfg. Co., 441 Folsom St., San Francisco, Calif.

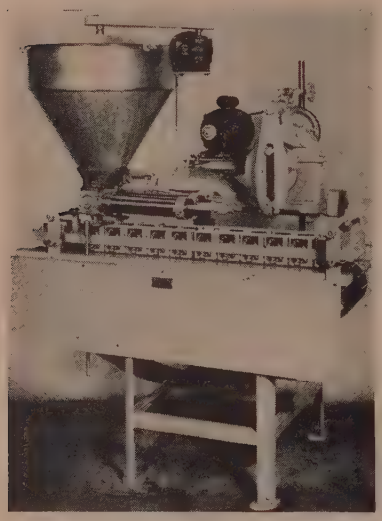
Nylon spray hose

This new high pressure spray hose weighs only 26 lbs. per 100 ft., and its extreme flexibility is provided through the use of 1-braid of nylon instead of the conventional multiple braids of rayon and cotton. The hose is constructed to assure 800 lbs. working pressure, while the burst minimum is 3000 psi. It is manufactured in 1/2″ I.D. size with an oil and chemical resistant tube, one braid of nylon and a smooth neoprene cover.

Manufactured by: Pioneer Rubber Mills, 345-353 Sacramento St., San Francisco 11, Calif.

What's new?

Frozen food fillers



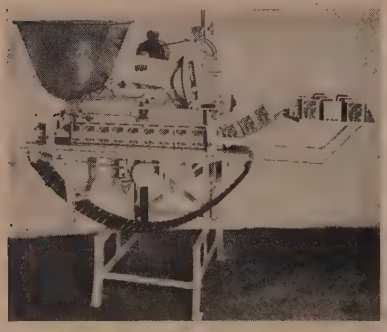
These frozen food filling machines (above and below) can be used for sliced strawberries, chopped spinach, apple sauce, and similar products.

For handling composite packages only, the Elgin 2-Cylinder Frozen Food Filler, Model "FF", is recommended. This machine incorporates the new principle of stop package filling, in which the package is carried on a continuous moving conveyor belt and automatically stopped and released at the filling station. This model is equipped with an 18-gallon hopper, separately driven agitator, and the newly developed fine fill adjustment.

Designed by: Elgin Manufacturing Co., Elgin, Ill.

Conversion unit

For packers presently using the previous model Elgin 2-Cylinder Frozen Food Fillers, the company has prepared a conversion unit to accommodate composite packages. This permits changing these machines over to



the continuous conveyor, stop package filling, with fine fill adjustment. This unit is available with complete instructions for installation at plant.

Available from: Elgin Manufacturing Co., Elgin, Ill.

SHIPPING

Carloading hood helps frozen foods

Protects them against damaging temperatures

AN EXTENSIBLE carloading hood, which helps preserve low temperatures when loading or unloading frozen foods from refrigerator cars, has been developed at a cold storage company in Boston. It is one answer to carriers' complaints of high initial loading temperatures at processing plants.

The canopy, shown in photos here, was developed by R. E. Sherbrooke, chief engineer, Quincy Market Cold Storage and Warehouse Co. The Refrigeration Research Foundation has called it "one of the best ways to give greater temperature protection to frozen foods and reduce surface condensation on cases."

The Boston company uses it to unload cars into a refrigerated receiving room where temperatures as low as 5° above zero are maintained.

How it's made

The hood is a simple modification of an awning. A 2x3 is bolted to the building on each side of the door, and above. These hold pieces are 11 feet tall on the sides and 12 feet across the top. They hold the canopy to the building. The sides of the extensible frame are also 2x3. The outer framing above and below is made of 1-inch pipe.

The pipe that extends upward from a hinge on each side (*see photos*) also extends continuously across the top. The lower and upper flaps are held rigid by piping in the hems. Four inches of extra canvas above protrudes beyond the uprights and helps make a seal against the car. The pipe in the outer edge or hem of the lower flap is pulled up by rope and held by tracks and guides on the uprights.

The cross brace, when pulled up on its track and held by a rope attached to a cleat, creates very satisfactory tension against the car. The canvas is No. 10 waterproof Army duck.

Need less to say, equipment of this kind must be tailored to fit individual requirements. Built by a local awning company, the Quincy installation cost about $140.00 for each canopy.

Here is frozen food canopy open, shown as seen from the railroad siding.

View from inside building shows hood fitted snugly against open refrigerator car. Full cost was about $140.

Mr. Sherbrooke reports that one matter of special concern during development of the hoods was the snugness of the fit against the cars. It was expected that some kind of rubber facing would be necessary. However, the weight of the canvas has proven sufficient for effective sealing against most cars. Holding the sliding brace in place with ropes assures sealing during loading operations, despite considerable movement of the car.

In an article in *Food Packer*, August 1950, A. L. Reneau, Pacific Fruit Express Co., pointed out the need for such canopies at many processing plants.

Fastest frozen filler

New packaging and filling system boosts loose frozen food packing to canning line speeds

AN AUTOMATIC high-speed packaging process, which can put a frozen food packaging line on an equal footing with canning lines, has been developed by the Marathon Corporation, Menasha, Wis.

The new equipment developed for free-flowing products, enables a packer to fill from 200 to 225 packages per minute, compared to the average of 115 per minute with existing cartons and machinery.

Using a glueless end-fill carton, developed by Marathon, in combination with a specially built machine, the new method has been tested with worthwhile results in speed and economy.

The new package is made of solid bleached board, heavily waxed inside and outside, with a special lock at either end. It is of standard retail size. It has exactly the same dimensions as the top opening, hinged cover package now used to package the majority of frozen foods, and overwraps currently in use will therefore fit the new carton exactly. Tests reported by the manufacturer prove the new carton superior in excluding air, and fully as moistureproof as packages now used. An additional advantage is that the flat cartons require only half as much storage space as present cartons. Less paperboard is used in their manufacture.

The machine, which sets up, fills and closes the cartons, is manufactured for Marathon by the Sprague-Sells Division of Food Machniery & Chemical Corp., Hoopeston, Ill. It requires only two operators. Carton flats, as they are received from the manufacturer, are placed in a magazine; then the machine opens the package, closes the bottom lock and sends the carton on to the standard volumetric filler, after which the package moves on to be locked. An automatic takeoff device drops the package into two lines of delivery to the wrapping machines. Two wrapping machines, each capable of speeds up to 125 a minute, are needed for each packing machine.

Available on rental

The pilot model machine, completed last February, has been tested by some of the largest frozen food packers on both the west and east coasts. The cover shows the machine at Seabrook Farms, Bridgetown, N. J. Among the products packed were peas, mixed vegetables, lima beans, and cut corn. The machine handles either fresh or pre-frozen products. Since free flowing items constitute 68% of the total pack, this is an important development. Present plans call for exclusive distribution of the machines through the Marathon Service Company on a rental basis. It is expected that they will be available for 1951 production in limited quantities.

Bacteria and frozen food quality

The chemical composition of frozen foods, the vitamin content, and individual taste preferences all enter in to affect quality. The sanitary conditions under which foods are prepared and processed are also reflected, according to recently revealed data by Drs. G. J. Hucker and W. B. Robinson of the Experiment Station at Geneva, N. Y.

This report deals with the relation of quality to the number of bacteria found in frozen peas, snap beans, and sweet corn stored at 10°F., at zero, and at −10° for various lengths of time.

It was found that relatively few bacteria were present when the fresh vegetables were brought into the freezing plant, but that bacterial counts on the finished products varied greatly, depending upon the care exercised in maintaining sanitary conditions within the plant. Except for sweet corn, however, there appeared to be little, if any, relation between number of bacteria and quality of frozen product.

What's new?

Antiseptic cleaner

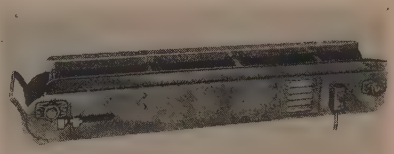
Increased sanitation in food processing establishments at a saving in cost over ordinary maintenance methods is now possible through the use of Westone, an antiseptic floor treatment with bacteriostatic properties.

Formulated primarily for the treatment of floors, Antiseptic Westone is now being used on tables, shelving and other fixtures and equipment in food plants.

Westone not only removes dust from floors but leaves an antiseptic film which inhibits the growth and multiplication of bacteria present. Its surface-sealing film holds down subsequent dust for quick and easy removal.

Developed by: West Disinfecting Co., 42-16 West St., Long Island City 1.

Small conveyor unit



This new conveyor model, identified as 100-U, is only five feet long. It is designed for applications where use of a smaller conveyor unit is considered practical.

Model 100-U is equipped with an 8″ neoprene-impregnated belt. Belt speed is approximately 125 ft.p.m. Take-up mechanism provides for ample belt adjustment. Pulleys are equipped with permanently lubricated and sealed ball bearings.

Side rails, which extend the full length of the conveyor, may be readily removed when it is used for handling cartons or bulky materials.

Manufactured by: Industrial Engineering & Mfg. Co., Brimfield, Ind.

James Heekin founded the Heekin Can Company in 1901 in this building where power came from a wheel driven by water from the Old Miami Erie Canal.

IT TOOK 50

A partial view of the big Norwood, Ohio plant covering approximately two squares.

A HALF CENTURY OF METAL PACKAGING

EXPERIENCE AND SERVICE

Note adequate railroad shipping facilities in these big connecting plants in Cincinnati.

LITHOGRAPHED OR PLAIN METAL CONTAINERS

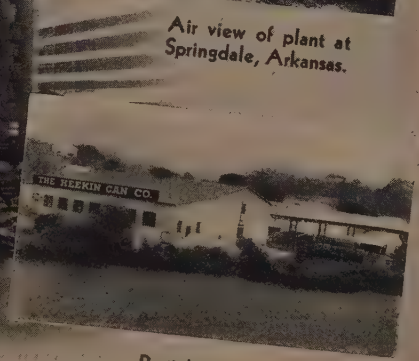
Theodore Roosevelt became President following McKinley's assassination.

YEARS TO WRITE THIS

Fifty years ago, a man with faith in these United States started The Heekin Can Company. Where else is Courage, Ambition, and Integrity so well rewarded? Where else can a man go into business and pass on to his successors the fruits of his labor? This company was founded on honest consideration of its customers, plus a personal service that makes business a pleasure. Today, the third generation of James Heekin is active in its management. They, too, believe in the future of this company.

First expansion was in 1908 to this plant which has since been substantially enlarged and completely modernized.

Air view of plant at Springdale, Arkansas.



Partial view of plant at Chestnut Hill, Tennessee.

1901 1951

HEEKIN CANS

THE HEEKIN CAN CO., CINCINNATI 2, OHIO

63 peaches: which are best for canning, freezing?

Soft-ripe canned fruit much preferred over firm, say experimenters in freestone packing

TO BE EVALUATED for canning or freezing, a peach variety should be tested for more than one year. Also, fruit harvested from trees which have borne for several years is often quite different from fruit harvested the first year or two.

In order to provide such evaluation, and to meet the growing need for better information on peach processing, the Agricultural Experiment Station at Clemson, S.C., began peach processing investigations in 1941. Eight years of such investigations are reported by L. O. Van Blaricom and A. M. Musser in a recent bulletin of the Station.

Their evaluation of 63 varieties of freestone peaches is summarized in the two tables on these pages. Table I gives the pertinent processing data, and Table II lists the varieties and their suitability for processing.

Variety	No. of years tested	Average diameter of fruit, inches	Pits, percent by weight of unpitted fruit	Peeling waste, percent by weight of pitted fruit	pH of fruit pulp	Total acidity*	Percent soluble solids, by refractomer
Afterglow	3	2.4	4.8	13.1	3.63	8.1	12.1
Ambergem	4	2.6	10.2	10.8	3.70	10.2	10.5
Armstrong	2	2.4	5.7	11.9	3.76	---	8.9
Augbert	1	--	8.5	5.6	3.70	9.1	9.8
Burbank July Elberta	5	2.2	5.9	12.2	3.69	8.7	11.2
Dixigem	4	2.3	6.8	13.3	3.76	7.5	11.6
Early Halehaven	1	--	5.7	14.5	3.60	8.9	11.7
Early Hiley	1	2.2	6.9	20.0	3.73	11.5	11.5
Elberta	5	2.5	7.6	12.1	3.81	8.2	11.2
Fireglow	3	2.5	5.5	9.9	3.74	9.5	10.1
Frank Cling	1	2.5	9.2	17.1	3.72	12.2	12.5
Gemmer's Late Elberta	2	2.8	5.2	12.5	3.81	9.6	10.1
Globe Haven	2	2.3	9.8	12.6	3.84	8.8	11.6
Goldeneast	2	2.3	7.2	11.0	3.57	8.3	12.1
Golden Elberta	1	--	12.3	12.1	3.90	8.2	9.7
Golden Jubilee	4	2.3	6.9	13.0	3.61	9.0	10.6
Halegold	3	2.2	6.2	16.9	3.68	8.3	11.8
Halehaven	4	2.5	7.3	13.9	3.75	7.7	10.6
Hardy Berta	2	2.6	7.0	14.9	3.75	8.0	11.8
Ideal	3	2.2	9.0	15.8	3.70	8.8	8.6
Jerseyland	1	2.5	---	---	3.53	12.7	10.5
Kalhaven	2	2.5	6.2	5.1	3.53	11.4	11.0
Lizzie	4	2.6	7.9	16.5	3.73	8.3	12.0
Massasoit	1	2.5	7.9	11.1	3.70	9.9	10.0
Mundell Seedling	2	2.4	6.7	15.0	3.60	8.5	11.0
Michigan-20	1	2.2	5.4	31.4	3.70	11.7	12.6
Midway	2	2.2	8.0	12.5	3.72	10.1	12.0
Penryn	2	2.6	5.3	14.6	3.70	9.2	12.2
Pickett's Favorite	1	2.6	4.9	15.6	3.50	14.2	10.8
Redhaven	5	2.3	9.4	16.9	3.79	12.6	10.7
Redrose	1	2.0	6.8	17.4	3.83	7.7	10.0
Redskin	2	2.4	7.7	12.0	3.53	10.5	11.7
Rio Oso Gem	5	2.5	5.8	7.5	3.51	11.4	11.4
Shippers Late Red	4	2.5	5.7	8.8	3.65	10.1	11.9
Southland	1	2.2	6.6	20.8	3.60	7.6	13.3
Sullivan Early Elberta	5	2.5	7.8	10.2	3.73	8.8	10.4
Sunbeam	2	2.2	7.7	21.6	3.72	9.8	11.0
Sunday Elberta	3	2.3	6.6	8.7	3.57	14.0	10.4
Sunhigh	5	2.7	5.5	10.4	3.76	7.9	10.7
Triogem	5	2.3	6.3	16.3	3.62	9.8	11.1
Valiant	2	2.6	5.8	11.1	3.61	9.1	11.2
Vedette	3	2.5	7.4	13.1	3.75	7.6	10.1
Vivid Globe	1	2.5	4.3	8.0	3.50	7.6	9.1
Welcome	2	2 7	5.2	9.2	3.63	10.8	13.4
Williamson Elberta	1	2.5	5.0	10.9	3.85	7.3	11.2
White Hale	1	3.0	2.4	2.5	---	---	---

* Figures indicate ml. of tenth normal NaOH required to neutralize 10 ml. of peach juice.

Table 1.—Processing data for 53 varieties of peaches. The figures for each variety are averages of observations recorded for the years it was tested.

The percentage of pits, in relation to total weight, ranged from 2.4 for the large White Hale in 1945, to 12.9 for Globe Haven in 1947. Peeling waste varied greatly, ranging from 2.5% for White Hale in 1945, to 26% for Ideal the same year. Peeling wastes are affected by fruit size, flesh firmness, stage of maturity, degree of bruising, and by peeling methods and conditions. The peeling waste of most good varieties will range from 8 to 14%. Trimming wastes are not indicated in the table since they vary widely with individual conditions.

Soluble solids tend to be high during periods when soil moisture is low, as was the case during the latter part of the 1947 season. Conversely, they tend to be low when the soil moisture is high. A high content of soluble solids or sugar in a sample of peaches is desirable and will influence most individuals to give it a relatively higher flavor rating than one with a low sugar content.

Picking time

From an ideal standpoint, peaches for processing should be picked when tree-ripe. However, from a practical standpoint, this is impossible because of the damage to freestone peaches during transportation to the plant.

At the Clemson laboratory, it was found most practical to pick the peaches after the flesh color of the yellow varieties had started to turn, but before the fruit became soft. Peaches may be held in cold storage rooms at 32-35°F., but must then be brought to ordinary room temperature for one or two days for final ripening. Fruit brought from the field and held in cold storage at 55-65°F. ripens quite uniformly, but a week or 10 days are required for them to do so.

Peaches may also be ripened by holding them for one to three days at room temperature.

Clemson found that fruit held at or below 65°F. ripened more uniformly and had firmer flesh. However, such fruit did not have the flavor or deep yellow color of fruit ripened at higher temperatures.

Since peaches ripen more uniformly at cold storage temperatures of 65°F. or lower, Van Blaricom and Musser conducted an experiment in 1944 in which fruit was stored in insulated rooms cooled by fans with night air and closed during the day. However,

this method had no advantage over ripening in ordinary storage rooms.

Complete agreement as to how ripe a freestone peach should be for canning has not yet been reached. However, Van Blaricom and Musser believe that peaches as grown in South Carolina should be at the soft-ripe or "eating-ripe" stage before they are either canned or frozen. Peaches which are too green to freeze are too green for canning or for preserves.

The canning of green or immature peaches is simply a way to destroy the peach canning industry, say Van Blaricom and Musser. Freezing or otherwise using ripe peaches, while canning the hard, green ones, is a practice which should be discouraged.

Comparisons of canned peaches made by the taste panels at the Clemson laboratory showed that peaches canned at the soft-ripe stage were much preferred over those canned at the firm stage. Results suggest that there is a vast market for canned peaches of the former type.

Table 2.—Evaluation of varieties of peaches for canning and freezing, based on observations by the authors.

Variety	No. yrs. tested	Suitability		Time of Ripening	Flesh color	Adhesion to pit	Uniformity of ripening	Color		Texture	Flavor	Tendency to Oxidize	Remarks
		For freezing	For canning					Canned	Frozen				
				***	*	**							
Afterglow	1	Poor	Poor	+ 7	Y	1	3	5	3	2	2	5	Much red in pit cavity and flesh.
Ambergem	7		Exc.	--	Y	C	1	1	1	1	1	1	Firm cling.
Armstrong	2	Fair	Fair	0	Y	2	2	2	2	3	1	4	
Augbert	3	Poor	Poor	+25	Y	1	4	3	3	3	2	5	
Burbank July Elberta	7	Good	Exc.	—12	Y	1	1	1	2	1	1	2	
Dixigem	4	Exc.	Good	+28	Y	2	2	2	1	1	2	1	
Early Elberta (Gleason)	2		Exc.	— 3	Y	1	1	1	1	1	1	--	
Early Halehaven	1		Fair	—20	Y	2	1	2	3	2	--	--	
Early Hiley	2	Exc.	Good	—20	W	2	2	--	--	--	--	--	
Eclipse	2	Poor	Exc.	—14	Y	1	2	1	1	2	2	5	
Elberta	7	Fair	Good	— 0	Y	1	3	2	3	2	1	4	
Fair Beauty	1		Poor	—22	Y	5	2	1	--	3	1	1	Semi-cling, soft flesh.
Fay	1		Good	0	Y	1	2	1	--	2	1-2	--	
Fireglow	4	Good	Exc.	—15	Y	1	1	1	1	1	1-2	2	Large-sized variety very good for processing.
Flaming Gold	1		Fair	—18	Y	2	3	3	--	2	2	--	Testing incomplete.
Fisher	1		Poor	—30	Y	5	2	2	--	2	2	--	
Frank Cling	2		Fair	+14	Y	C	2	2	--	1	2	--	Firm cling; browning of pit cavity severe in canned product.
Gage	2		Fair	0	Y	1	2	3	--	3	3	--	Brown pit cavity in canned product.
Gemmer's Late Elberta	4	Fair	Fair	+ 4	Y	1	3	3	3	2	2	5	
Georgia Belle	2	Good	Fair	— 4	W	1	2	--	--	1	1	3	
Giant Freestone	2		Poor	—12	Y	1	3	2	--	2	4	4	Rough, variable in size.
Globe Haven	4	Good	Exc.	— 7	Y	1	1	1	2	2	1	3	Slightly stringy.
Gold Drop	1		Poor	+ 7	Y	--	4	3	--	3	4	--	Very small.
Goldeneast	2		Fair	— 7	Y	3	3	2	--	3	1	3	
Golden Elberta	1		Poor	— 7	Y	C	2	1	--	3	2	--	Trees not vigorous.
Golden Globe	2		Fair	—20	Y	2	1	1	--	3	2	--	Flesh stringy.
Golden Jubilee	7	Good	Fair	—18	Y	1	3	3	2	3	2	2	Flesh soft, halves flat.
Halberta	1	Fair	Fair	+ 2	Y	--	3	--	2	2	2	3	Brown in pit cavity after canning.
Halegold	3	Fair	Good	0	Y	1	1	2	1	1	2	3	Large.
Halehaven	7	Good	Good	—10	Y	2	2	2	2	2	1	3	Somewhat stringy.
Hardee	2	Poor	Fair	--	Y	1	2	3	4	2	2	5	
Hardy Berta	4	Poor	Fair	+ 2	Y	1	2	3	3	3	3	5	Poor processor.
Ideal	3	Poor	Good	—10	Y	1	1	1	3	2	1	5	
Jerseyland	1	Poor		—30	Y	1	1	--	3	2	2	1	Red color throughout flesh.
Kalhaven	3	Good	Fair	+ 2	Y	--	1	3	2	1	1	3	
Lizzie	6	Poor	Fair	+20	Y	1	3	3	3	2	1	5	
Marigold	1		Poor	—30	Y	4	2	1	--	3	1	--	Soft, semi-cling.
Massasoit	1		Poor	—15	Y	--	--	3	--	--	2	--	
Mundell Seedling	2	Poor	Poor	0	Y	1	3	3	4	4	2	5	Soft, ragged.
Michigan-20	1	Exc.		—10	Y	1	1	--	1	2	2	1	
Midway	2	Poor	Fair	—15	Y	1	3	3	4	4	2	5	
Penryn	2	Poor	Poor	—15	Y	1	3	3	3	4	4	4	Small.
Pickett's Favorite	1	Poor	Poor	+ 7	Y	1	3	4	5	3	4	3	
Redelberta	1		Fair	— 7	Y	--	--	2	--	2	2	--	
Red Haven	4	Exc.	Good	—25	Y	3	1	1	1	1	1	1	Small, firm.
Red Rose	2	Good	Good	—14	W	1	W	W	W	2	1	2	Very small.
Redskin	1	Exc.		0	Y	--	2	--	1	1	1	1	Very promising.
Rio Oso Gem	5	Good	Good	+15	Y	1	2	2	2	1	2	2	Some brown color in pit cavity of canned product.
Salberta	2		Fair	+21	Y	1	4	3	--	2	2	--	
Shippers Late Red	6	Good	Good	+ 7	Y	1	2	2	2	1	2	2	Red pit cavity often brown in canning. (Very attractive red for freezing.)
South Haven	2	Poor	Fair	—15	Y	1	2	2	2	4	1	4	Stringy.
Southland	2	Good		—17	Y	1	2	--	1	2	1	1	
Sullivan Early Elberta	5	Fair	Good	— 7	Y	1	3	2	3	2	1	4	Similar to Elberta.
Sunbeam	4	Exc.	Good	—21	Y	2	2	1	1	2	1	1	Small.
Sunday Elberta	3	Fair	Good	— 7	Y	2	1	2	2	1	3	3	
Sunhigh	6	Good	Exc.	— 7	Y	1	2	1	2	2	1	2	
Triogem	6	Exc.	Good	—14	Y	2	1	1	1	1	1	1	
Valiant	4	Fair	Fair	—20	Y	2	3	2	3	2	1	4	
Vedette	5	Fair	Good	—10	Y	2	2	1	2	2	1	2	
Vivid Globe	1	Fair	Fair	0	Y	1	3	3	3	2	2	3	Pit cavity dark after canning.
Welcome	2	Good	Good	+ 7	Y	1	2	2	2	1	2	2	Hale type.
Williamson Elberta	1	Fair	Good	0	Y	1	3	2	3	2	1	4	Similar to Elberta.
White Hale	2		Poor	--	W	1	--	--	--	2	5	5	Poor flavor, subacid, firm.

* Y—Yellow; W—White.
** Clings are indicated by "C"; Freestones rated from "1" for completely free to "5" for semi-cling.
*** Days ripening before Elberta and after Elberta indicated by minus and plus, respectively. Other characteristics are also rated from 1 to 5 with "1" representing the most desirable condition. Where no number appears no determinations were made.

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Tomato late blight found not related to potatoes

Plant disease doctors reveal new control methods and chemicals at annual meeting

NEW METHODS and chemicals to control diseases in canners' acreages were revealed at the annual meeting of the American Phytopathological Society last month. Many food packers were represented at the three-day sessions held in Memphis, Tenn. Highlights of the daily meetings follow.

1. Several new ideas on controlling tomato blight were developed from research undertaken during the past growing season. The common belief that tomatoes growing near potato fields are more susceptible to late blight must be changed. A Wanatah (Indiana) field was planted with both potatoes and tomatoes. Although the potato vines died from the disease, the tomato plants continued to bear fruit. Two other experiments confirmed this finding.

Noting leaf lesions is insufficient evidence as a symptom of Alternaria (early) blight on tomato plants. If a leaf portion should turn a pale yellow green (chlorosis). check must be made whether a lesion has appeared on the petiole or stem below the discolored leaf.

2. Response of pea varieties in Michigan tests to Ceresan M varied with the method of applying the fungicide to the seed. Dry applications of 4 oz. per 100 lbs. of seed resulted in significant stand increases, where as stands of water slurry treated pea seeds were reduced.

Plants from seeds injured by water slurry were stunted, lacked secondary roots, and had shortened and browned radicles. Conclusions suggested that probably the water in the slurry allows the toxic material to reach the embryo during the period between seed treatment and planting, since seed planted immediately after treatment was not injured. Varieties tested included: Little Marvel, Wisconsin Perfection, Large White Marrowfat and Alaska.

3. The Society has prepared a list of 72 recommended chemicals to control the 68 major diseases found on vegetables and fruits. During 1949, over 200 chemicals were checked by 196 plant pathologists. As an example, to control late blight on tomatoes, 10 chemicals are recommended in the 25 states reporting this disease. For brown rot and leaf spot on sour cherries, 16 control chemicals have been accepted by the 24 states reporting. This information was presented at the recent Food and Drug hearings on residues. Complete copies are being printed and will be available soon.

1. New ideas on tomato blight control.
2. Dry vs. slurry pea seed treatment.
3. Prepare 72 disease control methods.
4. New fungicides announced.
5. Continuous pasteurizing of hot bed soil.
6. Overcome pickle disease.

4. Three new chemicals were announced and preliminary tests show value on canning crops. They are: Orthocide 406 (California Spray-Chemical Co.), Vancide 51 (R. T. Vanderbilt Co.) and Experimental Chemotherapeutanta 1182 and 1207 (Carbide and Carbon Chemicals Div., Union Carbide and Carbon Corp). Research field quantities of these fungicides are available for the coming growing season.

Orthocide 406 has already attracted the canning industry. By using 2-4 lbs. of a 50% formulation, within six weeks after application on fruits or vegetables residue counts fall to 1-4 ppm. Diseases have been controlled on cherries, grapes, apples, and tomatoes.

Vancide 51 has proved promising as a fungicide, seed protectant and soil drench. This material is completely soluble in water as a protectant and will not dust from treated seed. It has been successfully used as a soil drench to control damping off of spinach. Both tomato seed and leaves, as well as cucumber seeds, have been protected with Vancide 51.

Experimental Chemotherapeutants 1182 and 1207 are effective internal toxicants for certain systemic diseases of plants. Included among these are the vascular wilts of tomatoes and virus X disease of peaches. These materials are being evaluated on diseases heretofore not susceptible to control by chemical treatments applied externally to plants. No residue data on this material is available at present.

5. An economical flash type continuous soil pasteurizer was announced. Originally designed for heating sand and gravel, a mobile heater and dryer has been successfully adapted for soil pasteurization. Soil shoveled into the upper end is tumbled against the hot sides of the cylinder and emerges in a few seconds from the lower end. Excellent control of damping-off and weed seeds has been obtained at a fuel cost of less than one cent per bushel of soil. Heat is supplied by a blow torch.

6. Overcoming diseases of cucumbers is progressing rapidly, namely scab, bacterial wilt and virus. A pickling cucumber resistant to scab has been developed. This disease is prevalent during cool weather and causes skin lesions that lower the quality of the processed pickle. This variety was bred at the Wisconsin Station. Seed will not be available until 1952.

Studies on bacterial wilt of cucumbers showed that the disease increased in severity with increase of nutrition. Specifically disease development was favored by a low nitrogen supply and high potash; wilt decreased as the nitrogen supply was increased.

How cucumber mosaic virus overwinters has troubled many growers. Milkweed has been suspected of harboring this disease, but research in Wisconsin points to home gardens in nearby villages. Perennial ornamentals such as phlox, flowering surge and white cockle were found to be hosts of the virus.

What's new?

Water for soil testing

A new and refillable ion exchange unit now delivers water equal in chemical quality to triple-distilled from an ordinary faucet. Called the Filtr-Ion, it is the smallest application of the Monobed ion exchange principle.

It was designed for small-quantity uses where more elaborate equipment would be impractical, such as for soil analysis. Although the tube is only 8½" long and 1⅝" in diameter, its chemical action is identical with that of the larger water-conditioning units.

Produced by: La Motte Chemical Products Co., Towson, Baltimore 4, Md.

Irrigation tube

The giant aluminum Kingsiphon delivers large quantities of water for ditch and flood type irrigation systems. The unit is 6" in diameter, 10' long, with a triple bend designed to fit and operate from concrete-lined as well as dirt ditches.

The Kingsiphon is made of heavy gauge aluminum irrigation pipe. The tube features smooth bends, is seamless, and is easy to handle since it weighs only 13 lbs. A welded-on handle facilitates starting.

Manufactured by: Reynolds Metals Co., 2500 S. Third St., Louisville, Ky.

F_2 hybrid tomato

Sunnybrook is a recently developed F_2 tomato, originally bred for the home gardener. Last season several processing firms were enthusiastic after testing this variety.

A small Michigan processor found a measured acre and one-quarter "produced 22 tons of ripe tomatoes, averaging better than 99% U.S. No. 1. The Sunnybrook produced even shaped, meaty fruits that were free from cracks and any sort of blight whatever."

This hybrid is produced similar to the true sweet corn hybrids, now universally used by the canning and freezing industry. In comparison trials, this hybrid showed more vigor with greater yields and several times produced more uniform fruit. Very often it is possible to incorporate into the hybrids resistance to a number of diseases and insects.

Trial sample from: Growers Div., W. Atlee Burpee Co., Philadelphia 32, Pa.

CANNER'S ACREAGE

Do chemical fertilizers affect nutritive values?

Research shows that source of vitamins and minerals in processing crops is immaterial

By C. H. MAHONEY
National Canners Association

PART TWO

Jones and Parker (1947) determined the effect of nitrogen fertilization on the content of nitrogen and ascorbic acid in Valencia orange juice over an 8-year period in California. They found an overall inverse correlation (-.875) between nitrogen and ascorbic acid in the fruit. They also found the amount of nitrogen in the juice was determined by the amount of nitrogen applied as a fertilizer. However, they point out that the addiamounts of nitrogen per tree annually tion of organic matter providing equal resulted in a highly significant decrease in nitrogen in the juice but had no effect on the ascorbic acid.

Jones and Parker (1949) in a later report found the same over-all negative correlation between nitrogen and ascorbic acid content of Navel juice, but there were two exceptions at Claremont where the trees received only a moderate amount of nitrogen and at Riverside where the plots received the same amount of nitrogen. They also report: (1) Individual applications of nitrogen, phosphorus and potassium increased the amount of each in the juice. (2) Growing winter cover crops reduced the concentration of both nitrogen and potassium in the juice and caused a slight increase in calcium. (3) The use of manure alone greatly increased the potassium and reduced the nitrogen and calcium concentrations in the juice. (4) The following significant positive correlations were found: (a) potassium of juice with per cent total acid in juice; (b) phosphorus of juice with per cent of juice of whole fruit. (5) The followng negative correlations were found: (a) phosphorus of juice with per cent acid in juice; (b) ascorbic acid of juice with phosphorus of juice.

Pineapple oranges

Smith, Reuther, and Gardner (1949) applied differential phosphate treatments of 0, 1, 3, and 8 units of phosphoric acid to each 4 units of nitrogen to young Pineapple and mature Valencia orange trees grown on Norfolk sand in Florida to determine their influence on fruit quality. They found: (1) The fruit from the first two crops of the 5 year-old Pineapple orange trees showed no response to differential phosphate fertilizer. (2) The fruit produced by the 25-year old Valencia trees after 5 and 6 years of treatment showed that with increased amounts of applied phosphates there was a lowering of total soluble solids, citric acid, and ascorbic acid. (3) There were significant positive correlations (a) between nitrogen and phosphorus content of the juice; (b) between total soluble solids and ascorbic acid of the juice. (4) There were significant negative correlations (a) between phosphorus and ascorbic acid of juice; (b) between phosphorus and total soluble solids of the juice; (c) between nitrogen and ascorbic acid of juice; (d) between nitrogen and total soluble solids of juice.

Other citrus research

Sites (1949) has rather clearly evaluated the fertility data of the Citrus Experiment Station in Florida to determine the comparative influence of organic vs. inorganic nitrogen on the yield and quality of citrus fruit. He points out first, however, that any fertility program for citrus in Florida must include the application of magnesium, calcium, zinc, and manganese to prevent decreases in yield and quality of fruit. Nitrogen was applied as 100% inorganic and as 40% organic to Duncan and Marsh grapefruit and Hamlin oranges, to determine the influence on yield, external, and internal quality of fruit. The results show: (1) The five-year average soluble solids of Duncan fruit were generally higher under a completely inorganic program. The difference was not large and was not significant. (2) There were no significant differences found in juice content, soluble solids, slash, titratable acid, or vitamin C content. (3) Marsh fruit data showed that the treatments caused no significant differences in composition of the juice. (4) The influence of 100% organic vs. 40% organic nitrogen on yield of grapefruit show an 8-year average increase of 145 lbs. per tree of Duncan grapefruit in favor of inorganic nitrogen, which is just short of significant; on Marsh grapefruit an 8-year average increase of 207 pounds per tree for inorganic nitrogen which was highly significant.

The Hamlin orange plots received four differential nitrogen treatments: 100% organic, ammonia nitrogen, nitrate nitrogen, and one-third each. The effect of these treatments on internal fruit quality were: (1) The soluble solids were highest in juice from the ammonium sulphate

treatment and lowest from trees which received all their nitrogen as castor pomace. This difference was highly significant. (2) There were no significant differences in gallons of juice per box, total acid, or ascorbic acid.

The influence of these differential nitrogen treatments on the yield of Hamlin oranges show: (1) The five-year average yield was 570 lbs. per tree for ammonium sulphate as compared with 432 lbs. per tree for 100 per cent castor pomace treatment. This difference of 138 lbs. per tree is statistically significant. (2) Differences in yield between trees receiving castor pomace, sodium nitrate, and a mixture of the three were not significant.

The work shows that all production trends are strongly in the direction of increased yields from the inorganic nitrogen source as compared with 40% organic or 100% organic sources of nitrogen.

Bondorf (1950) has reported on field experiments at Askov, Denmark started 54 years ago to answer the question as to whether soil fertility can be maintained by the exclusive use of artificial fertilizers, and to determine also the value of artificial fertilizers in comparison with farmyard manure. During each rotation of crops grown on these plots the same average amounts of plant nutrients have been applied as farmyard manure and as artificial fertilizers. The crops grown have been winter cereals, root crops, summer cereal, and clover-grass hay. It was found that on both the loam and sand field artificial fertilizer has given considerably higher yields than farmyard manure with the same content of nitrogen, phosphorus and potassium. Only in clover and lupins has the farmyard manure proved superior to artificial fertilizer. These results have likewise been obtained at five other stations in Denmark.

It was found also that the recovery of the phosphorus and potassium which had been applied in the form of manure or chemical fertilizers was essentially the same. The recovery of nitrogen from crops which received nitrogen in artificial fertilizer was 70% of the amount applied; whereas only 30% of the amount of nitrogen applied as manure was recovered.

Schuphan (1948) in his recent book has published rather comprehensive data on mineral and vitamin contents of vegetables grown in Germany. He has included the results of some very interesting experiments on the composition of vegetables as influenced by the use of manure alone and manure plus the addition of nitrogen, phosphorus, and potassium.

He reports the results of no fertilizer, manure, manure plus N P K, and N P K alone on the composition of cabbage. It appears from the data in table 16 that there was a small but consistent increase in crude protein of cabbage receiving manure, manure plus N P K and an increase from N P K alone over manure or a combination of manure and N P K. This was likewise true for ash and crude fiber. There was a slight but consistent decrease in calories from the fertilizer treatments.

Schuphan reports on an infant nutrition experiment (p. 148, table 37 and fig. 9) where children were fed vegetables fertilized with manure alone and manure plus N P K. Because signs of anemia had been observed in those children given vegetables as supplementary food fertilized with manure alone, it was supposed that these signs of anemia were due to mineral deficiencies, especially iron and copper. Schuphan contends that part of the anti-anemic effect of spinach and other green vegetables can be attributed to the folic acid and nitrogen and that the anti-anemic effect can be considerably increased through additional N P K fertilization.

Effect on infants

He reports data (table 37) which show that vegetables which received manure plus N P K fertilization contained 29% more iron and 38% more copper than the vegetables which received manure fertilization only. The infants were fed these vegetables as supplementary food for a period of three months and blood analyses for iron serum, hemoglobin, and number of red blood corpuscles were made at three intervals. Due to a chicken-pox infection there was a reduction of the serum-iron values for all children in both groups. However, the serum-iron value of the infant group is lowered considerably, namely from 90 to 68 gamma % for the group fed vegetables grown with manure only, whereas the decrease was much less in the group fed vegetables fertilized with manure only, namely 86 to 80 gamma %.

The hemoglobin expressed as grams oxy-hemoglobin improved in the group of infants receiving vegetables fertilized with manure plus N P K as compared with the group receiving vegetables for the manure plots alone. This condition was likewise true for red blood corpuscles expressed in millions.

Schuphan also presents data in table 48 giving the yield, per cent dry matter and carotene content of tomatoes and carrots from plots fertilized with manure alone and manure plus N P K. There was a slight increase in yield and a significant increase in carotene from the plots receiving N P K in addition to the manure.

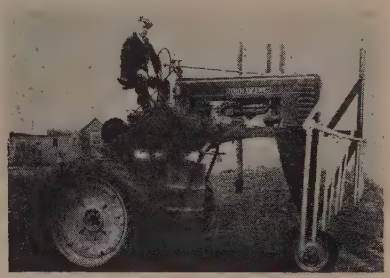
These tomatoes and carrots were fed to infants as supplementary food and the blood was analyzed at the beginning and end of the experiment for vitamin A and vitamin C (table 49). There was a 3½ fold increase in the vitamin A blood content of the group receiving tomatoes and carrots grown with manure plus N P K. There was likewise a 22.7% increase in vitamin C content of the blood of infants receiving tomatoes and carrots from the manure plus N P K plots.

The average increase in weight in grams of the infants fed tomatoes and carrots from the manure plus N P K plots was 28% higher per day than those infants fed the vegetables from plots receiving manure only. Schuphan points out that the better increase in weight of infants in the group "manure plus N P K"

(Continued on page 44)

What's new?

Tractor stilts



Tractor stilts simply bolt to the axle and frame of any unaltered tractor. A good hoist and ordinary tools are all that are needed to mount or remove them prior to spraying sweet corn.

The barrel carrier rides between the rows suspended beneath the body of the tractor. Wheel weights and fluid in the tires lowers the center of gravity.

An underslung barrel frame is available, either 100 or 200 gal. capacity. The stilts are made of electric welded ⅜" steel plate, braced for strength.

Manufactured by: Rhoades Mfg. Co., Blair, Neb.

Zinc-copper fungicide

Cop-O-Zink is copper fungicide containing zinc. It has proved more effective than copper alone in the control of blight on several canning crops. Particle size is extremely fine, insuring uniform coverage on foliage. A thin film resists action of rain or overhead irrigation systems. Cop-O-Zink is compatible with essentially all of the new organic insecticides and most of the older pesticides.

It has already been recommended for uses on tomatoes, lima beans, cucumbers, sour cherries and grapes.

Manufactured by: Tennessee Corp., 619 Grant Bldg., Atlanta 1, Ga.

Fertilizer kills pea weeds

Weed eradication must pay annually because killing weeds is a yearly job. Costs can be reduced by using Aero Cyanamid, Special Grade, which is both a herbicide and fertilizer, on cannery peas.

There is no need for prolonged disking to rid soil of weed growth which delays planting and reduces pea yield. Weed eradication with Aero Cyanamid allows early planting. Reduced pea yields are often caused by nitrogen and calcium deficiency shown by yellowing of vines during growth. Cyanamid supplies these missing nutrients.

Brochure from: American Cyanamid Co., Agricultural Chems. Div., 30 Rockefeller Plaza, New York City 20.

field notes

items of interest on quality canning crop production

Fertilizer shortage seen for spring

With a possible acute shortage of commercial fertilizers predicted for next spring, G. O. Baker, soils specialist for the University of Idaho, urges farmers to buy and store an adequate supply for their 1951 use immediately.

Baker said he was basing his suggestion on a letter received from Russell Coleman, president of the National Fertilizer Association. In the letter, Coleman predicted that "fertilizer supplies will not be adequate unless there is an early and constant flow from the mines and the factories to the farm." To keep such a flow in progress throughout the opening winter months, he suggested that farmers use fertilizers early in those localities where fall applications are recommended or buy and store the fertilizers in sections where spring application is the best practice.

Keeping the fertilizers dry is the first thought in storage as there is a tendency for both phosphates and nitrogen fertilizers to cake and harden if moisture gets to the material. Keeping sacks off the floor and in a dry building usually guarantees that it stays in good condition for use in the spring.

Chinese cabbage used for club root test

Chinese cabbage is being used as a guinea pig by scientists at the New York Agricultural Experiment Station, Geneva, as a quick check on fields to be planted to cabbage or cauliflower. This will determine possible infection of the soil by the cabbage club root organism.

Quick growing and exceedingly sensitive to club root, Chinese cabbage can be planted in fields intended for cabbage as soon as the land is prepared. A check can be made in this way on possible soil infection well in advance of transplanting time.

Club root is a soil-borne disease capable of remaining active for years even in the absence of host plants, according to Dr. Robert F. Foster, plant disease specialist. There are no resistant varieties of cabbage or cauliflower, and control is largely a matter of sanitation and the avoidance of infected soils. Club root may exist unsuspected in fields for years, however, so some way to check the soil for possible infection in advance of transplanting would be helpful.

In the method developed by the Station workers, Chihli Chinese cabbage was broadcast at the rate of one-half to one ounce of seed per acre after the first rough fitting of the land. Then just before refitting for transplanting the young Chihli plants were pulled from a number of random spots in the field.

If the club root organism is present, the characteristic clubs will be found on the plants.

New cannery tomatoes popular

Over half of the acreage of cannery tomatoes grown in New York in 1949 was devoted to three new varieties originated at the New York Agricultural Experiment Station, Geneva. The new tomatoes are Gem, Red Jacket, and Longred.

While all three tomatoes are notable for their good red color and productiveness which makes them attractive both

(Continued on page 36)

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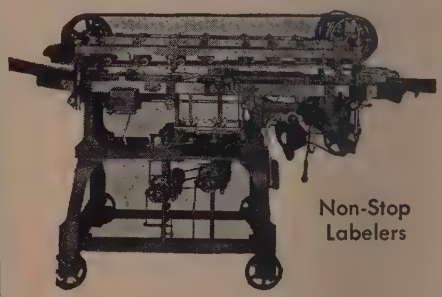

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COLORADO POTATO BEETLE
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COTTONY PEACH SCALE
CUCUMBER BEETLE
DIAMONDBACK MOTH
FIG SCALE
FLEA BEETLE
FLORIDA RED SCALE
FORBES SCALE
GRASSHOPPERS
GREENBUG
GREEN JUNE BEETLE GRUBS
LEAF FOLDER
LEAFHOPPERS
LEAF MINER
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MEALY PLUM LOUSE
MELONWORM
MEXICAN BEAN BEETLE
MIDGE
MITES (many species)
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PICKLEWORM
PLUME MOTH
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field notes

(Continued from page 34)

to the grower and the processor, each has additional qualities which have contributed to their popularity.

Gem is noted particularly for its heavy early yield when it is closely planted on fertile soils. Under good growing conditions, the variety will produce 10 tons of red ripe tomatoes before September 10. Gem is not an early variety when measured in terms of single fruits, according to Prof. W. T. Tapley of the station. But when planted three by four feet or two by five feet, several clusters on each plant will ripen early, resulting in heavy pickings prior to September 10.

Red Jacket is outstanding for its good red color which has made it most attractive for juice, catsup, and chili. The foliage, which resembles that of the potato, is thick and heavy, insuring good color to the fruit throughout the season.

Longred, as its name implies, is a well-colored, long-season variety. It is popular with canners for its size and with growers for its productiveness.

Longred and Gem are also good home garden varieties. Seeds and plants of all three varieties are now generally available from commercial sources.

Leafhoppers carry western X disease

A leafhopper has been found to carry the virus that causes the western X disease to peach trees. The discovery was made by entomologists of the Washington and Oregon Agricultural Experiment Stations and the USDA. One leafhopper was found to be enough to infect a healthy tree.

Special Field Meetings

Jan. 3-5—Pennsylvania Annual Fieldmen's Conference, Pennsylvania State College, State College

Jan. 8-10—Processors' Fieldmen's Conference, Michigan State College, East Lansing.

Jan. 10-11—Pest Control Conference with Wisconsin Industry, Loraine Hotel, Madison.

Jan. 11-12—Illinois Cannery Fieldmen's Meeting, Union Bldg., University of Illinois, Urbana.

Jan. 22-25—Purdue Fieldmen's Conference, Union Bldg., West Lafayette, Indiana.

Jan. 23-24—Canners & Fieldmen's Meeting, Iowa State College, Ames.

Feb. 5-6—Ohio Fieldmen's Conference, Deshler-Wallick Hotel, Columbus.

Feb. 5-10 — Canners' and Freezers' School, Oregon State College, Corvallis.

Feb. 14-15—Minnesota Fieldmen's Meeting, Radisson Hotel, Minneapolis.

Develops easy-mix home jelly

Successfully markets 20 different flavors

By F. M. NIER
Seattle, Wash.

LIQUIFIED JELLY, marketed as Jel Juce by the Food Manufacturers Inc., has found acceptance in a large number of grocery stores five months after its introduction in the Seattle market. The product, which was introduced to the housewife on August 10, comes in 20 imitation flavors retailing at 20 to 25 cents per eight-ounce bottle.

Easy to use, the item reduces jelly costs to a nickle per glass. It requires the addition of three cups of water, five cups of sugar (two pounds at a cost of 25 cents) and a three-minute rolling boil for a nine-glass yield.

The imitation fruit flavors include currant, blackberry, raspberry, strawberry, gooseberry, apricot, peach, pineapple, mint, apple, grape, loganberry, huckleberry, lingonberry, plum, quince, date and, during the holiday seasons, cranberry. When present laboratory experiments are completed, an additional ten flavors will be available. Berry flavors, according to early sales statistics, have exceeded all other fruits in favor.

The container costs and transportation expenses are kept at a minimum which, considering the disparity in freight rates eastward, permits a western firm to economically handle distribution nationally.

Production system

The belt-line production of Jel-Juce is simple. Bill Hauber, chemical engineer who originated the product and is president of the firm, supervises mixing operations. Mixing is a two-man procedure; the entire process requires seven employees. Should demand require, plant layout is flexible enough so that production could be doubled with little effort. Present capacity is 350-cases per day.

Chemically-resistant alloy tanks with fifty-gallon capacity each are elevated in a mixing room. Ingredients are dissolved in water, and an impeller, powered by a half-horsepower engine, mixes thoroughly. (The major production problem is the mixing which averages half an hour per mix.) Test runs are made of each mix before bottling to insure uniformity of the product.

Pure food flavorings and colorings used are manufactured by Crescent Manufacturing Co., Seattle, Washington, especially designed by their chemists to give the best possible flavor and color to the finished product. Thoroughly-mixed solutions are gravity fed to filler tank, located in an adjoining room (20x25 feet). A triple-feed action fills bottles, supplied by the Northwest Glass Company of Seattle, which are capped at the rate of 600 per hour by Crown Cork equipment.

Labels, imprinted by the Schmidt Lithograph Company of San Francisco, are applied by women employees. Label design consists of a green background with an off-red motif. Text states: "Ready to Jell JEL JUCE; add only sugar and water." Directions enumerate three elementary steps: 1. Pour measurements into a pan. Bring to full boil. Add Jel-Juce. Boil for three minutes. Pour and seal. 2. Fruit or fruit juices may be substituted for equal parts of water. 3. JEL JUCE may also be used manner as regular pectin.

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FLASH HEAT—

(Continued from page 21)

aroma between the original juice and reconstituted concentrate containing reincorporated volatile essence.[7]

The injection heater, combined with vacuum evaporative cooling, has been used in a number of flavor-damage and microorganism-destruction tests. Apple juice was inoculated with viable cells and spores of *Schizosaccharomyces octosporus* in the amount of 20,000 organisms per milliliter, then heated to a temperature of 244° and cooled to 80° F. in a total time of 0.7 second. No viable organisms could be cultured from samples of the processed juice.

Raw milk has been heated to temperatures ranging from 185° F. to 245° F. and cooled back to 80° to 90° F., in total times ranging from 0.5 to 0.7 second. Samples of the products were evaluated by standard methods by technical personnel of a dairy company. The raw milk had plate counts of 25,000 and 49,000 organisms per milliliter in the two series of tests; all processed samples had plate counts of "less than 100," the lowest value determined in the plate count test. The enzyme phosphatase was inactivated in all samples; unidentified coli organisms were also killed.

Samples processed at 245° F. had less cooked flavor than is produced during ordinary pasteurizing operations; samples processed at lower temperatures approached the flavor of raw milk except for the substantial deodorization effected by the treatment. During the tests on milk, some milkstone was deposited on the inside surfaces of the injection heater, but no visible deposit of milkstone was found in other parts of the system. The actual temperature above which the milkstone is deposited during short time processing in this equipment has not been determined, but is known to be below 245° F.

Concentrates milk, too

Milk was also concentrated to 26% solids in a single pass through the combination evaporator with good results. The milk attained a temperature of 240° F. in the injection heater; the single tube evaporator was operated with steam in the jacket at 330° F. The total time of processing, including the time required for vacuum evaporative cooling, was 0.6 to 0.7 second. The product was outstandingly sweet and full-flavored, and was otherwise characterized by low viscosity and by absence of the cooked flavor typical of evaporated milk. Storage or stability tests have not been made.

Fouling has not been a problem during the handling of a variety of fruit and vegetable materials in the combination evaporator. Peas were pureed in a comminutor without the addition of water, and were stripped at atmospheric pressure, i.e., without the use of vacuum on the system, to recover off-flavor components. Twenty-two percent by weight of the mixture of pea puree and steam injected in the direct-injection heater was evaporated by the single-tube evaporator, using steam at 60 psi in the evaporator jacket. Operation was continued for 1.2 hours. After the run was completed and the system rinsed with water, the equipment was disassembled and inspected. No trace of fouling was found.

Strip berry purees

A puree prepared from raspberries and youngberries was stripped for recovery of volatile essences, using the injection heater coupled to the single-

(Continued on page 40)

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WHEELING, WEST VIRGINIA

(Continued from page 38)

tube evaporator. Approximately atmospheric pressure was maintained in the system during operation. During stripping, 14% by weight of the mixture of puree and injected steam was vaporized. The overall heat transfer rate in the short, single-tube evaporator remained constant at 525 BTU/hr.-sq. ft.-°F. during the entire operating period of one hour. Subsequent inspection of the equipment showed no sign of fouling.

During the 12-hour run on apple juice, the overall heat transfer coefficient in the single-tube evaporator dropped from an initial value of 640 to a final value of 560 BTU/hr.-sq. ft.-°F. (based on the inside area of the evaporator tube). Upon inspection at the end of the run, the evaporator tube was found to be practically clean. A barely perceptible deposit was found at the discharge end; a slightly heavier, soft deposit was found near the inlet. The tube was easily cleaned by brushing to restore the original heat-transfer coefficient.

Construction, operation

Steam Injection Heater—The steam injection heater used in most of our studies is shown in detail in Fig. 1, and consists of a small chamber provided with a steam inlet and a product inlet and outlet. The model shown has a chamber ¾" in diameter and 6" long to provide a fluid retention time of about 0.8 second at a processing rate of 50 gallons an hour. Smoothness of operation of the injection heater is not impaired by inserting a ballast into the chamber to reduce the fluid retention time to about 0.4 second. The lower limit of processing time has not been determined.

Pumped at fixed rate

Product is pumped through the heater at the desired fixed rate; retention time during heating is determined, therefore, by the feed rate, the volume of the chamber, and the amount of steam injected. Steam is admitted as necessary to attain the desired processing temperature; the amount of steam required depends upon the difference between the feed and processing temperatures. (The injected steam must, of course, be clean to avoid introduction of foreign flavors or odors into food products.)

The injection heater is highly stable in operation if steam, feed, and product flow rates are suitably balanced so that pressures are properly staged through the heater, and if adequate mixing is obtained in the mixing chamber of the heater. Tangential entry of steam promotes mixing in the chamber and improves stability of operation. Our experimental heater employs removable and interchangeable orifices in the inlet and outlet lines to provide flexibility of operation. For a fixed installation, ways of providing more sanitary construction are obvious.

During operation, the mixing chamber must be maintained at sufficient pressure to prevent boiling therein and to ensure complete condensation of steam; a chamber pressure about 10 psi in excess of the steam-liquid equilibrium pressure of the fluid in the chamber is usually sufficient. Chamber pressure is maintained at the proper value by providing the proper relationship between the flow rates and the size of the discharge orifice. Surging, a possibility if the injected steam does not condense at a uniform rate, is controlled by proper staging of pressures by the various orifices in the inlet and outlet lines.

Operation of the injection heater may be checked by temperature measurements. In the experimental model, a fine-gage themocouple is located just

(Continued on page 42)

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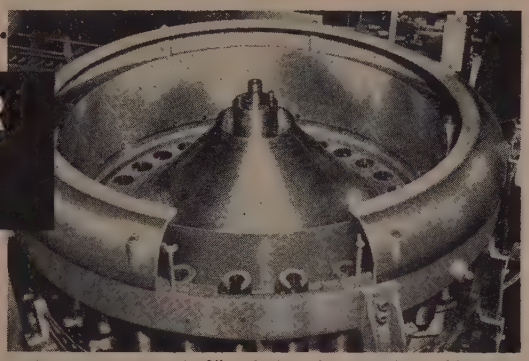
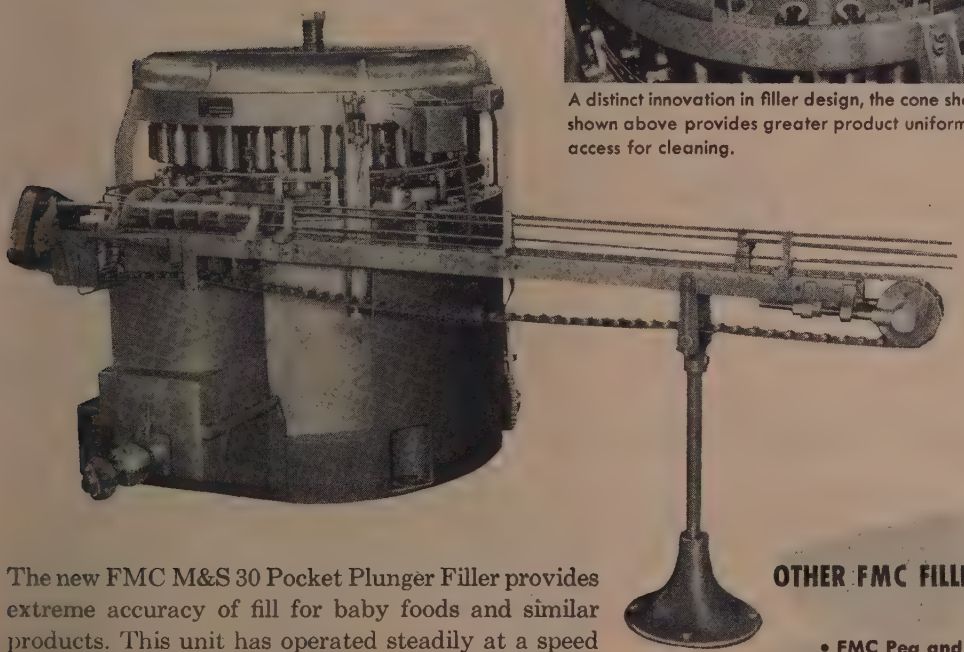


A distinct innovation in filler design, the cone shaped hopper shown above provides greater product uniformity and easy access for cleaning.



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Designed to handle whole-grain corn, peas, red kidney beans, pork-and-beans, hominy and other products. Unmatched for speed, efficiency, accuracy and economy. Available in 6 and 12-pocket models and also a 4-pocket type designed especially for No. 10 cans.

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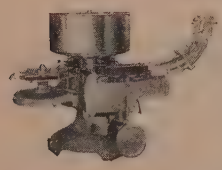

For tomatoes, citrus and other juices or as a Syruper to add any free-flowing liquid. Has large radius, large supply tank, faster-operating valves and air-operated bowl liquid level control to insure uniform, accurate fill at high capacity. Available in 12 and 24-valve models.

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(Continued from page 40)

upstream from the heater discharge orifice, and is connected to a continuous-balance, potentiometric type of temperature recorder. The temperature of the fluid leaving the injection heater remains constant to within 1 or 2° F. for periods of an hour or more, even when the steam is controlled manually. Automatic control of the injection heater may be provided readily, for example by a diaphragm valve of the throttling type located in the steam line and operated by a temperature controller of the type indicated above.

Injection heater as a Straight-Tube Evaporator Component—Combination of the steam injection heater with a straight-tube evaporator, as shown in Fig. 2, results in a novel vaporizer or evaporator which possesses several advantages over conventional systems. The "combination" evaporator used in our studies consists of the steam injection heater coupled directly to a section of ½ inch IPS stainless steel pipe which is steam jacketed over 6 feet of its length. The jacket is provided with standard fittings such as a steam inlet, a condensate outlet, vents, and a pressure gage.

In operation, the liquid discharging from the injection heater is superheated at least 5 to 10° F. with respect to the pressure at the entrance of the evaporator section. The superheat effects a slight vaporization as the fluid leaves the injection heater; a substantial increase in fluid volume results so that the fluid enters the evaporator tube at high velocity. Velocity is further increased by vaporization of fluid in the evaporator. The total time of retention of fluid in the combination system, including both the injection heater and the tubular evaporator, may be kept below 1 to 1.5 seconds without difficulty. High heat-transfer rates are attained as a direct result of the high velocity maintained in the evaporator tube; a less obvious result of high velocity is a scrubbing action which keeps the tube clean and minimizes fouling.

Advantages and applications of both the steam-injection heater and the combination evaporator will become apparent in the descriptions of systems using the devices, to be published in FOOD PACKER next month.

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(Continued on page 44)

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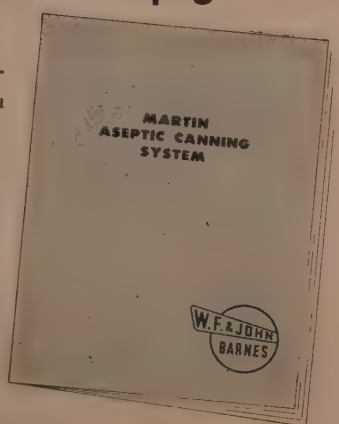

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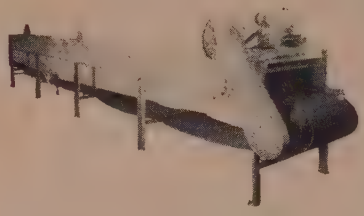

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CHEMICALS—

(Continued from page 33)

is not due to calories but to the influence or organic and inorganic elements on tissue-building and metabolism. He attributes this to the supplementary minerals, vitamins, hormones, and enzymes.

Summary

A review has been presented covering the experimental work performed under both field and greenhouse conditions to determine the effects of both mineral and organic fertilizers on the mineral and vitamin composition of those vegetables and fruits which are recommended by dietitians as a part of the diet of children and adults.

The green leafy vegetables such as turnip greens, spinach, kale, broccoli, and collards are generally considered to be good sources of minerals and either ascorbic acid or carotene, or both, and the results of differential fertility experiments have been reported in some detail. The results show, in general, that there was a consistent increase in yield from heavier rates of application of either a complete fertilizer or of nitrogen. Nitrogen gave the highest increases in yield where other elements were not lacking. There were slight variations in the content of calcium, phosphorus, potassium, and iron of these leafy vegetables due to differential fertilizer treatments. This was likewise true for ascorbic acid which was depressed to some extent by nitrogen in a number of experiments. The most significant conclusion reached by these workers, however, was that the influence of location on mineral and vitamin composition was from 13.75 to 20 times greater than the effects produced by fertilizer treatment. There appeared to be no consistent general correlation from year to year between the nutritive levels of the different soil types and the composition of the crops grown on these soils. The heavy application of macro-nutrients in addition to complete fertilizer in most cases improved the quality of the crop and there was a slight improvement, though usually not significant, in the mineral content of the greens.

The work done by Hester on the composition of tomato puree as influenced by heavy rates of application of nitrogen, phosphorus, potassium, and heavy rates of a complete fertilizer show some very interesting results. He found that increasing the nitrogen in the complete fertilizer up to 225 lbs. per acre, in the presence of ample phosphorus, potassium, boron, magnesium, and manganese gave a progressive improvement in red color, total solids, and nitrogen content of puree. There was a slight decrease in ascorbic acid with the heavier rates of application. He also found that with progressive increments of potassium in the mixed fertilizer there was a comparable improvement in red color, increased total solids, ash, sugar, vitamin C and titratable acid in the puree.

Hester also presents data on the influence of rates of application of complete fertilizer of 500, 1000, 2000, and 3000 pounds per acre on the average composition of puree based upon a period of years on a wide variety of soils. The results show that the total solids, ash, titratable acids, calcium, nitrogen, and potassium content of the puree were significantly increased with the higher amounts of fertilizer. The vitamin C content increased up to the 1000 pound rate and slightly decreased with the higher amounts.

He also made a careful comparison of the comparative value of no manure, manure, and the equivalent minerals and nitrogen elements found in the same amount of manure on the quality of puree from tomatoes grown on these plots. All three treatments were given in addition 1000 pounds of a 5-10-10 fertilizer per acre. Contrary to popular belief, the yields and quality of tomatoes were superior for those plots receiving the minerals and nitrogen found in manure to those grown on plots fertilized with manure. The important quality factors of the puree, which were influenced by purely chemical fertilizers, were increased color, total solids, ash, sugar, titratable acids, and nitrogen. There was an insignificant decrease in ascorbic acid.

Influence of nitrogen

The influence of heavy rates of application of nitrogen or complete fertilizer on the ascorbic acid and mineral content of peaches in Missouri and citrus fruits grown in California and Florida show that in general the yield and external quality of the fruit is improved. In the case of both peaches and citrus there was an inverse correlation of nitrogen and ascorbic acid in the fruit. The effect was more pronounced in citrus fruits than in peaches. The workers in both California and Florida present detailed data on other internal fruit quality factors which are influenced by fertility treatment but in most cases these variations, though possibly significant, are of no great practical importance as compared with variety, growth, and production.

The work done by Sites at the Citrus Experiment Station in Florida is of especial interest since he compared the

(Continued on page 46)

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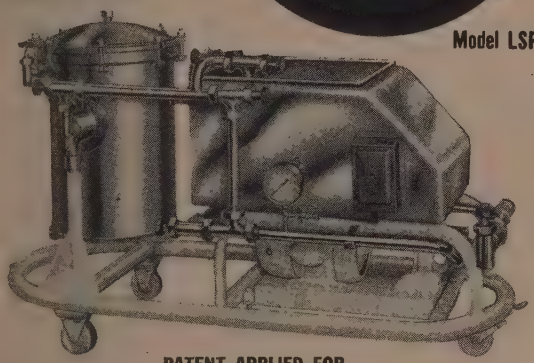

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(Continued from page 44)
influence of organic vs. inorganic nitrogen on the yield and quality of citrus. He found there were no significant differences in juice content, soluble solids, slash, titratable acid, or vitamin C content of either Duncan or Marsh grapefruit due to the application of 100 per cent inorganic or 40 per cent organic nitrogen. There was a highly significant 8-year average increase in yield of Marsh grapefruit in favor of the inorganic nitrogen program and though there was a similar increase in yield of Duncan grapefruit during the same period in favor of the inorganic program, the difference is just short of significance.

Hamlin oranges

In his work with Hamlin oranges he found that in a comparison of 100 per cent organic, 100 per cent ammonia nitrogen, 100 per cent nitrate nitrogen, and a combination of one-third each the soluble solids were highest in juice from the ammonium sulphate treatment and lowest from trees receiving 100 per cent organic nitrogen. The 5-year average increase in yield from the ammonium sulphate treatment was likewise significant.

Research by Schuphan in Germany has shown that the nutritive value of vegetables has been definitely improved by the application of complete chemical fertilizer with manure to soils as compared with manure fertilization alone. This work assumes greater practical significance in view of the arguments of "organic gardeners" since the beneficial results were determined biologically by feeding infants for a period of three months. The blood of the infants was analyzed for iron serum, hemoglobin, red blood corpuscles, vitamin A and vitamin C at regular intervals. There was a distinct improvement in iron, hemoglobin, and number of red blood corpuscles of the children receiving vegetables fertilized with minerals plus manure as compared with those receiving vegetables fertilized with manure alone. There was likewise a 3½-fold increase in vitamin A content and an increase of 22.7 per cent in vitamin C content of the blood of the group which received tomatoes and carrots fertilized with minerals and manure over the group receiving vegetables fertilized with manure alone.

Conclusions

The results of the research work presented in this paper definitely refute the contention that the use of chemical fertilizers in obtaining high yields and high quality vegetables and fruit crops causes a reduction in the nutritive value of these crops for human consumption. High yields and high quality vegetables and fruits can be produced only under conditions of an ample balanced supply of the major nutrients in the soil such as nitrogen, phosphorus, and potassium and of the macronutrients such as calcium, magnesium, manganese, boron, sulphur, copper, and zinc. The question of whether these elements are supplied to the soil solution from organic or inorganic sources is immaterial in the metabolism of the plant. Furthermore, experimental results have proved the necessity of making heavy applications of the major elements and lesser applications of the macronutrients to farm soils, in addition to incorporating organic matter, in order to obtain the high yields of vegetables and fruits under intensive cultivation methods. This is particularly true under those conditions in the east where heavy plant populations are grown under irrigation. Soil fertility and plant nutrient studies conducted during the next decade might logically include additional evaluations of the effects of plant nutrition on the maturity, palatability, and on those nutritive values which are considered of prime importance for the food crops under study in order to obtain further detailed information.

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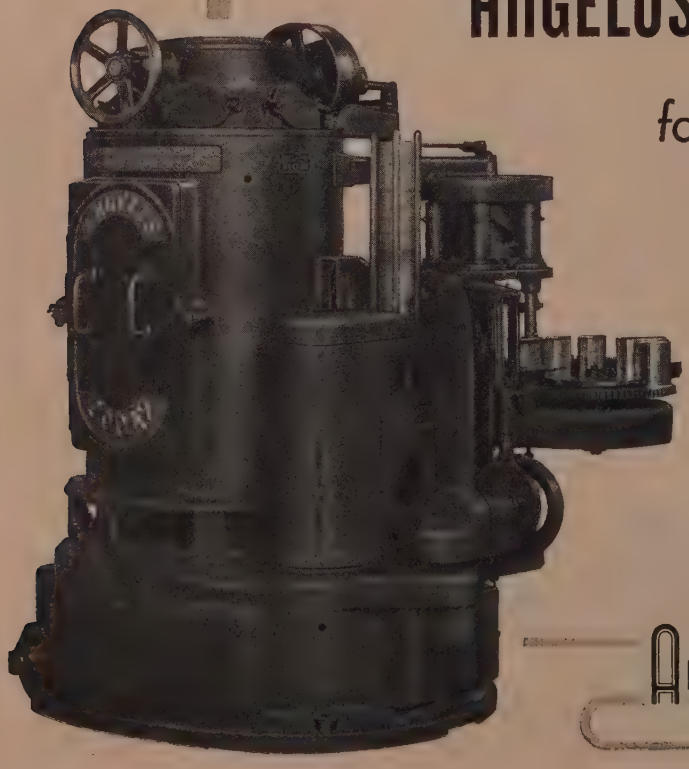

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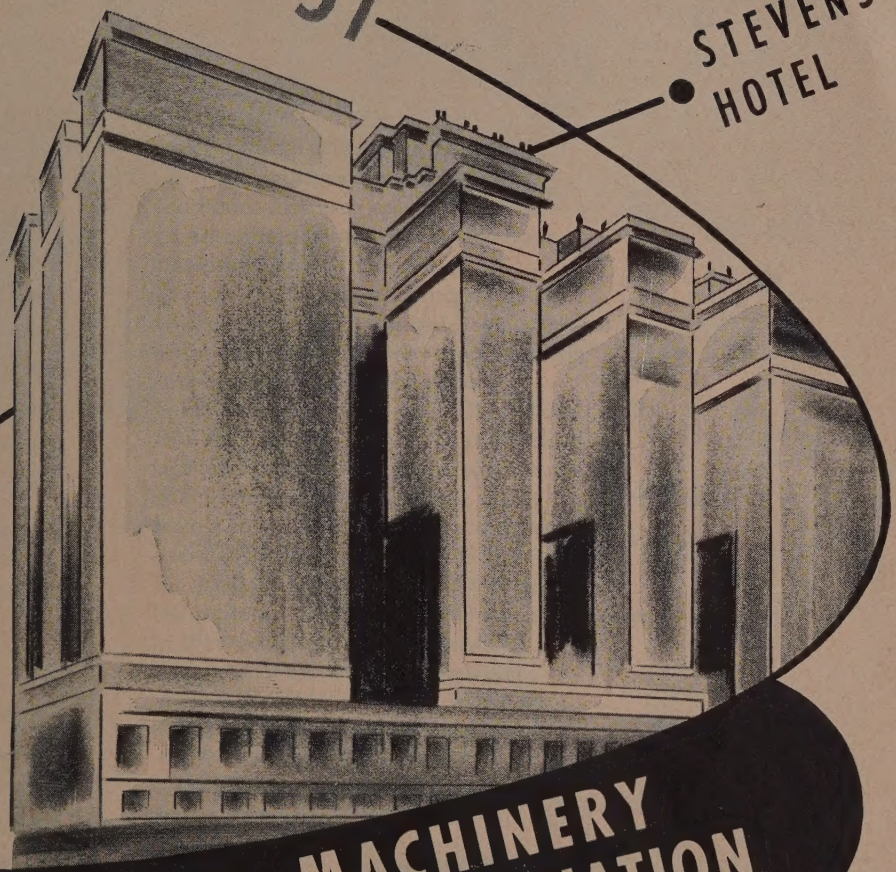

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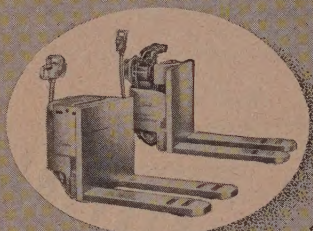

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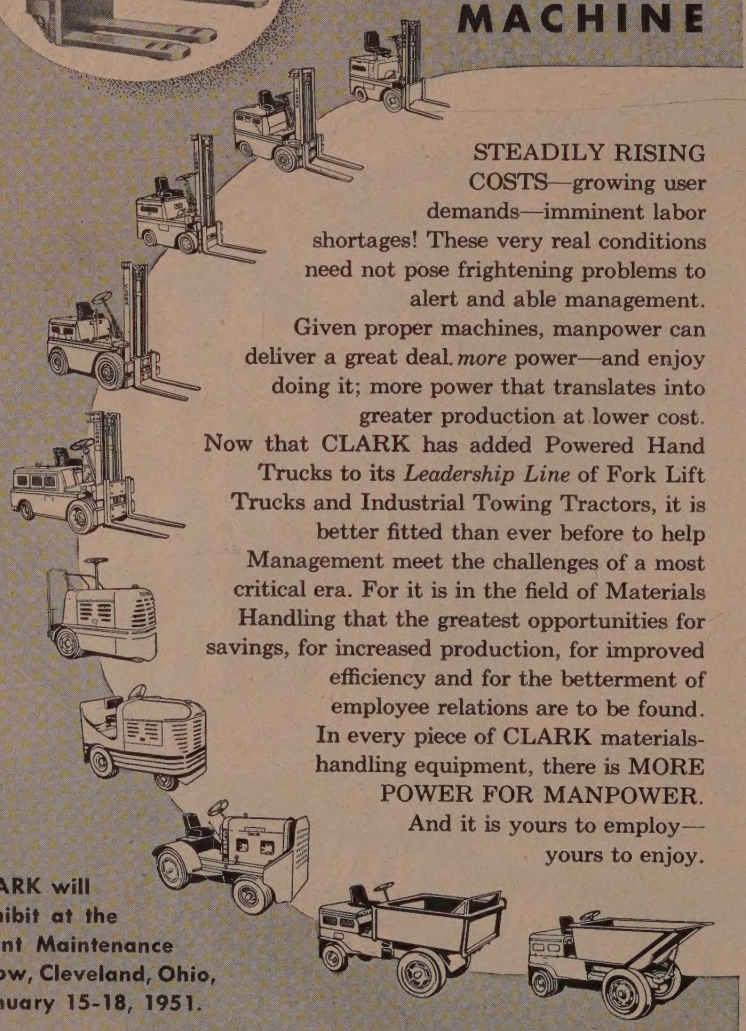

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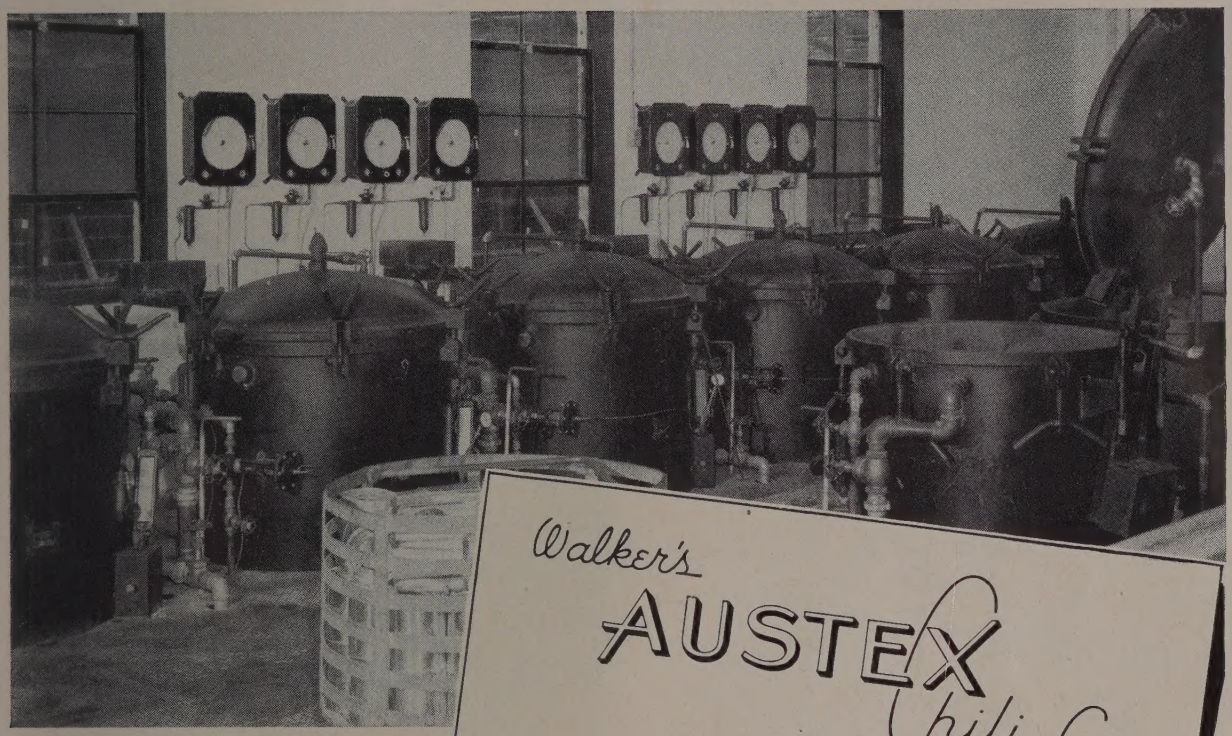

New, Taylor-controlled retort line at Walker's Austex Chili Co., Austin, Texas.

Walker's
AUSTEX Chili Co.

Gordon E. Mills
VICE-PRES. & PROD. MGR.

Austin, Texas

November 3, 1950

Taylor Instrument Companies
7041 Harrisburg Boulevard
Houston, Texas

Attention: Mr. Joseph C. Laley

Dear Mr. Laley:

Feel sure that you will be glad to learn that we are quite pleased with the operation of our latest Taylor instrumentation on our new Retort Line.

We are impressed with the simplicity of operation and precise control of temperature, which is so necessary for maintaining consistent quality control.

Sincerely yours,

WALKER'S AUSTEX CHILI COMPANY

Gordon E. Mills

GEM/inr

Gordon E. Mills
Vice-Pres. & Prod. Mgr.

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